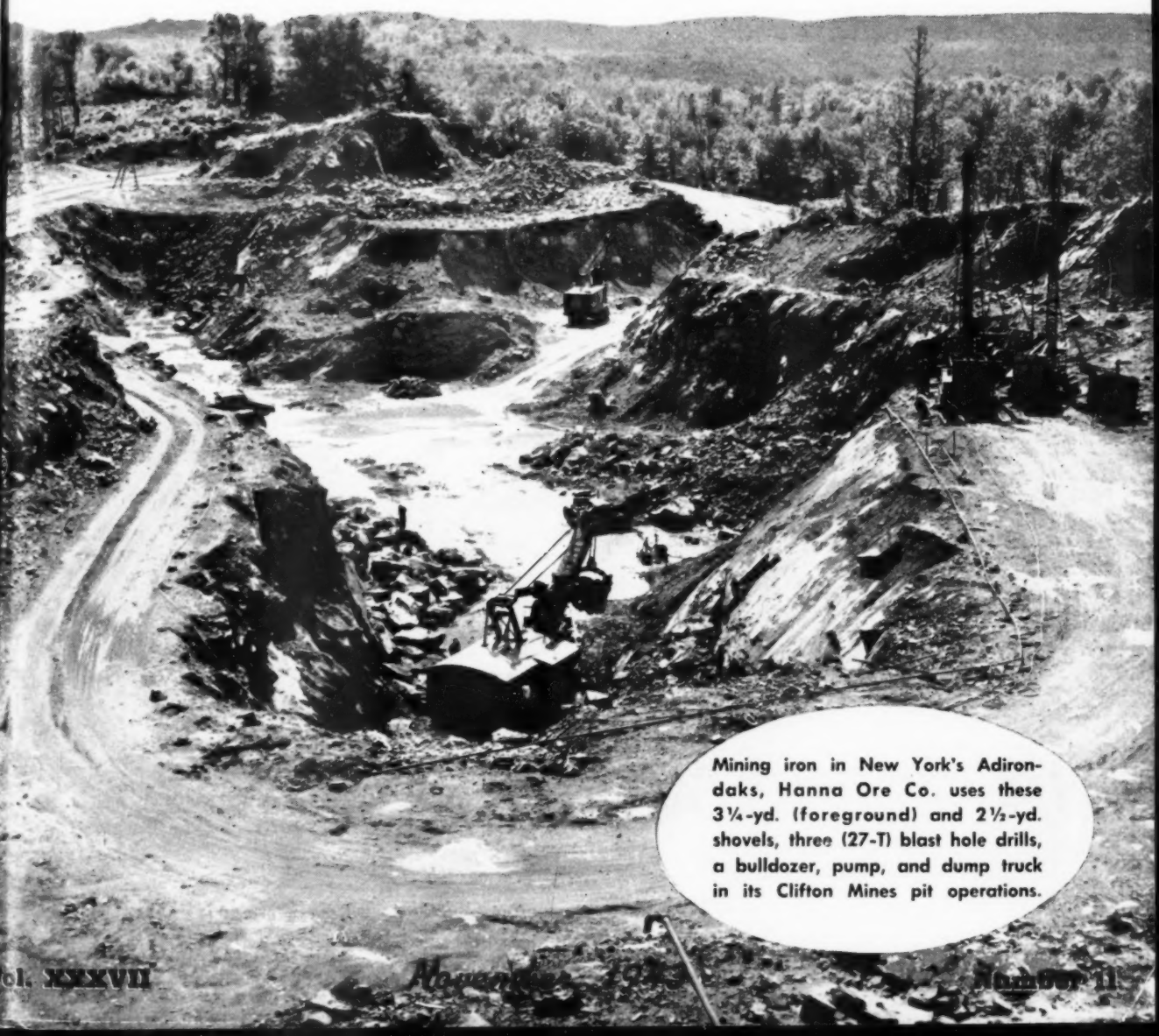
EXCAVATING ENGINEER

FOUNDED 1905



Mining iron in New York's Adirondaks, Hanna Ore Co. uses these 3¼-yd. (foreground) and 2½-yd. shovels, three (27-T) blast hole drills, a bulldozer, pump, and dump truck in its Clifton Mines pit operations.

Vol. XXXVII November 19[illegible] Number 11

Make your CRANE Last longer

Wartime construction puts heavy demands on crawler cranes. Here are a few suggestions that may help you keep your rig going at top speed for the duration:

- Keep surface of drum well lubricated for smooth rope spooling.
- Keep brakes and clutches in good adjustment.
- Inspect the entire machine regularly and remedy any troubles while they're still small. Remember to inspect sheaves, watching grooves, guards and lubrication.
- Follow manufacturer's recommendations for lubrication.
- If there are long waits between lifts or moves, shut off engine, never let it idle for long periods.
- Use proper rope length for each job. A too-long rope means excessive overwinding and that increases wear greatly. Rope life can often be increased by reversing ropes end for end.
- Keep close watch for frayed or damaged cables.
- If boom hoist operation is not necessary on particular job, it should be tried and adjusted at regular intervals.
- Call on your distributor for help with special service or maintenance problems.

ARMY E NAVY

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

EXCAVATING ENGINEER

FOUNDED 1905

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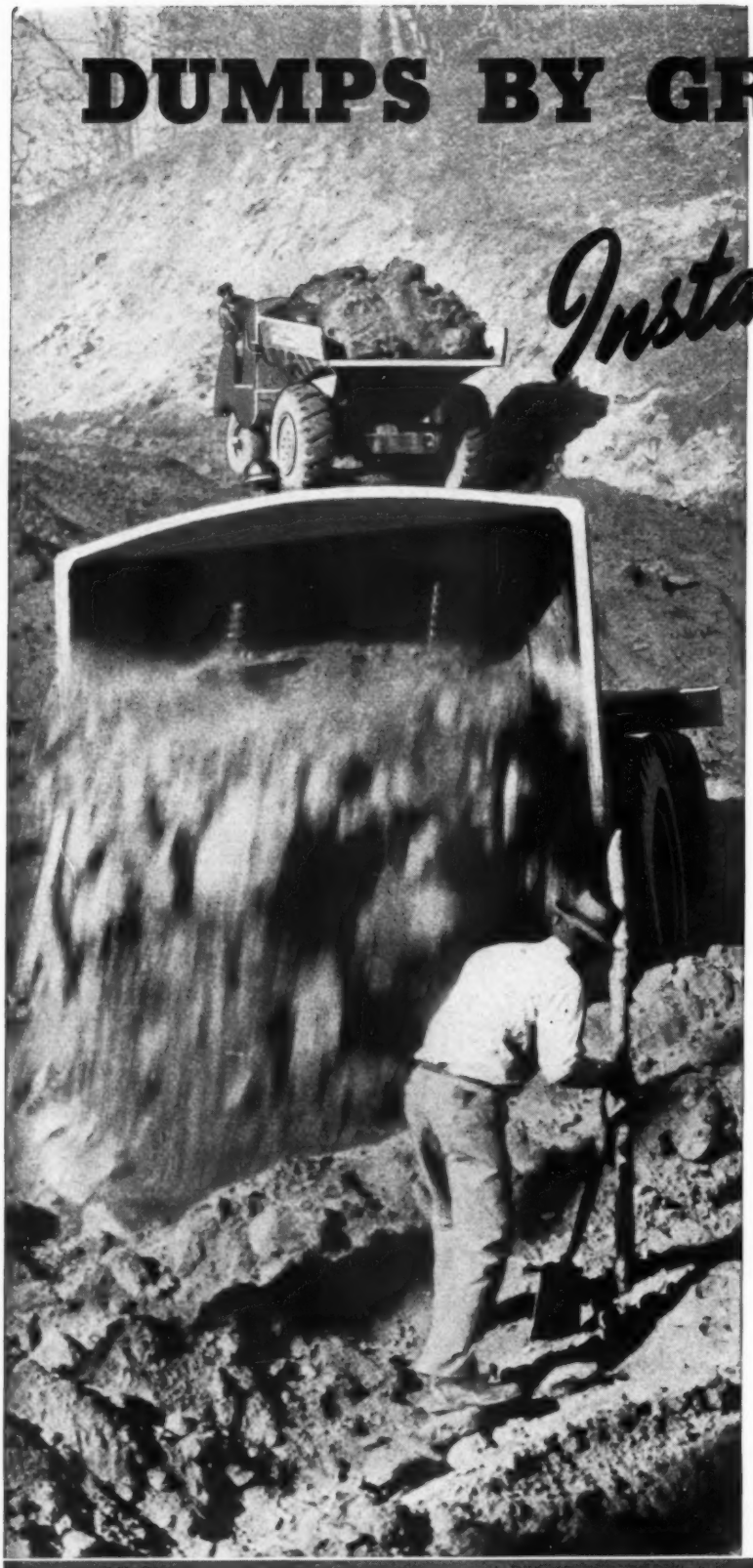
DUMPS BY GRAVITY *Instantaneously*



SECONDS SAVED ON THE FILL INCREASE PRODUCTION . . .

Koehring Dumptors dump the load by gravity...instantaneously. Just lightly trip lever, body latch releases, and load dumps. Sticky muck is loosened by the automatic kick-out pan. It's simple because gravity has no breakdowns...no worries ...only surplus speed. This surplus speed cuts round trip time...this time saved is your surplus production. Dumping by gravity...its immediate. Nature provides no mechanical delays.

KOEHRING COMPANY
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KOEHRING HEAVY DUTY

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A byword for advancement in the fire apparatus field, "Ward LaFrance" is also a symbol for specially-engineered motor fleets of many types. Today, hundreds of Army Heavy Wreckers from Ward LaFrance production lines are in use on the world's battlefronts. When their big job has been completed, remember: If your fleet has a specialized job to do, you need special trucks. Ward LaFrance engineers can help you get more from your automotive investment.

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Beating an Army Schedule

Bad ground water conditions, a 20-acre peat bog and snakes fail to deter M. J. Boyle Co. from essentially completing $3,500,000 Patterson Field airport extension job 30 days ahead of schedule

THE M. J. Boyle Co. of Chicago established an enviable record for a job well done when it essentially completed, 30 days ahead of schedule, construction of a $3,500,000 extension to Patterson Field, army air base at Fairfield, near Dayton, Ohio, in spite of the fact that the original contract called for only 60% of the work actually done. The original completion date anticipated approximately 220,000 sq. yds. of paving work, but later additions brought the total paving done to 414,000 sq. yds. The job involved ditching, grading, construction of a storm water sewer system, and building and paving three long runways, hangar aprons and taxiways in an area that had previously been considered too marshy to develop as an airfield.

The job was completed ahead of schedule in spite of bad ground water conditions, the presence of a 20-acre peat bog that had to be excavated and filled with borrow, and the presence of rattlesnakes in great numbers. To offset the many construction problems, the M. J. Boyle Co. had excellent cooperation from Army Engineers at Patterson Field and had, close at hand, the necessary material supplies with which to work—sand, gravel, water and cement. The Company also had plenty of equapment available. A labor camp close to the field of operations, provided by the contractor, solved the manpower situation.

Ground water presented one of the most serious problems in construction work at Patterson Field. Water was within one foot of the surface in many places and it was within five feet of the surface in the entire area developed.

In general, the area finally developed had a clay overburden of from one to two feet with a sand and gravel substrata. Clay veins that ran through the sand and gravel substrata formed marshy pockets throughout the entire area and complicated the drainage difficulties.

Open Four Drainage Ditches

To meet the ground water problem and make possible excavation, grading, and laying of concrete, the first work done by the M. J. Boyle Company was to open four drainage ditches, each about a mile long with 12-foot bottoms and average depths of from ten to 12 feet. With one exception, each of the four drainage ditches was an existing open ditch that was straightened, widened and cleaned out. One ditch, Ditch No. 2, was newly dug. The outfall of the drainage area was the Mad River whose level was about 12 feet below the existing ground elevation.

Four draglines, a 2½-yard Manitowoc, a 2½-yard Northwest, a 1½-yard Bucyrus-Erie and a ¾-yard Bucyrus-Erie were used exclusively in digging the four drainage ditches. The Manitowoc and Northwest each had 60-foot booms, the 1½-yard B-E had a 55-foot boom, and the ¾-yard B-E had a 45-foot boom. Two of the ditches, No. 3 and No. 4, requited quite a bit of brush clearance. The draglines, together with Caterpillar D-8 tractors with LeTourneau bulldozers, were also used for this clearing work.

The spoil from the ditches was stacked on the banks and after it dried it was spread and leveled with bulldozers. Caterpillar tractors with one 10-foot Drott, one 11-foot and one 12-foot LeTourneau, one 11-foot and one 12-foot La Plant-Choate bulldozers were used for this work.

After the main ditches were completed, lateral ditches were cut to connect various marshy areas where water was confined by clay barricades in the substrata. From 6,000 to 8,000 feet of auxiliary ditches, varying in width and depth from four to six feet, were dug with the draglines. Ditching involved the excavation of about 60,000 cubic yards of dirt.

A 20-acre peat bog area, with the peat ranging in depth from two to six feet, made the drainage work more than just an ordinary ditching problem. The nature of the peat bog area was revealed by test borings conducted by U. S. Army engineers in a checkerboard fashion over the entire area. Much of the auxiliary ditch footage was confined to this peat bog area. Draglines working in this bog had to be operated on mats. In order to make a suitable base for runways, the peat was excavated from the bog and replaced with a sand and gravel fill from a near-by borrow pit, adjacent to the airport area proper.

• Six clamshells were used at the batch plant moving aggregate to secondary stock piles and filling hoppers. In the above picture Bucyrus-Erie ¾-yd. (left foreground) and 1¼-yd. (right foreground) clamshells fill hoppers with sand while Koehring 1½-yd., Bucyrus-Erie 1½-yd., Marion 1¾-yd. and Northwest 1½-yd. clamshells handle the aggregate in the background.

where Koehring, Unit, Northwest and Manitowoc shovels were kept busy loading out an average of 5,500 cubic yards of borrow per 10-hour day for seven days a week. The Koehring and Unit shovels used in the borrow pit had ¾-yard dippers, the Northwest had a 1½-yard dipper and the Manitowoc had a 2-yard dipper. Thirty-two trucks, including three 5-yard Internationals, eleven 4-yard International K7's, three 4-yard Ford dump, and fifteen 8 to 10-yard trucks of various makes were used to haul the borrow and spoil the peat. The average haul was one mile from the borrow pit to the peat bog area.

Other equipment used interchangeably in the borrow pit and peat bog area included: an International TracTracTor, Model T-9; a nine-foot Bucyrus-Erie bulldozer; several D-8 Caterpillar tractors with LeTourneau bulldozers with 12-foot blades; a 1,000-gallon tank truck with a Gunnison sprinkler; a Caterpillar 50 tractor with LaPlant Choate bulldozer; a Caterpillar motor patrol with 12-foot blade; a Caterpillar Highlift end-loader; welders' and shop equipment, and two Kohler 1½ kw and three Master Light, 5 kw, light plants.

Drain Peat Bog

Before the bog could be excavated it had to be drained so that it was possible to handle the peat. About 350,000 cubic yards of peat were taken from the 20-acre area. The excavated peat was disposed of in two ways, the greater portion was wasted in two spoil areas adjacent to the airport and the remainder was hauled to refill the borrow pit. All material used to fill in where the peat was excated was hauled from the borrow pit.

Three methods of peat excavation were used. The two-yard Manitowoc shovel, which was used interchangeably in the borrow pit and peat bog, was spotted on the border of the peat bog, and after the shovel dug its way down through the peat to the sand and gravel substrata, it was worked forward into the bog. Trucks were used to haul the peat from the bog and other trucks brought back gravel from the borrow pit and built up a road behind the shovel from which the trucks could be loaded by the shovel. The sticky nature of the peat made it impractical to use the trucks for double hauling. The ditching draglines on mats were also used to excavate part of the peat bog, especially in the beginning when Ditch No. 3 was cut through the wet bog to drain the peat for further excavation. Caterpillar D-8 tractors with LeTourneau bulldozers, with 12-foot blades were used in areas where the peat did not extend any more than two feet below the surface and were also used in grading the approaches to the peat bog. The draglines were also used to excavate the deeper material.

Working 20 hours a day, in two 10-hour shifts, the peat removal and borrow replacement were completed on July 23, just three months after operations started, in spite of intermittent delays due to adverse weather. Ditching operations, started March 30, were completed on April 23. During part of the ditching operations crews worked on three eight-hour shifts and at other times work continued 20 hours a day, on two 10-hour shifts.

The presence of numerous marsh rattlesnakes and water moccasins made the job of excavating in the peat bog area somewhat hazardous. It is estimated that more than 500 snakes were killed during the excavation of the peat. The Army stationed an ambulance at the site during the digging operations in the peat bog as

• Left: An RD-8 Caterpillar tractor with LeTourneau bulldozer levels off borrow from piles like the ones being dumped from trucks in the background. Below: Two 34-E dual drum Ransome pavers and Koehring bullfloat at work paving one of the 25-foot sections of a runway.

M. J. Boyle Co. Personnel at Patterson Field

C. L. SOGGE
General Superintendent

JOHN POYNTON
Field Engineer in charge of co-ordination

WILLIAM THOMPSON, THOR SOGGE
Paving Superintendents

PAUL DONOVAN
Master Mechanic

R. L. HERBERT
Batch Plant Superintendent

R. J. SAVAGE
Chief Accountant

E. H. BOLTON
Office Engineer

R. J. GROSS
Superintendent of Sewers

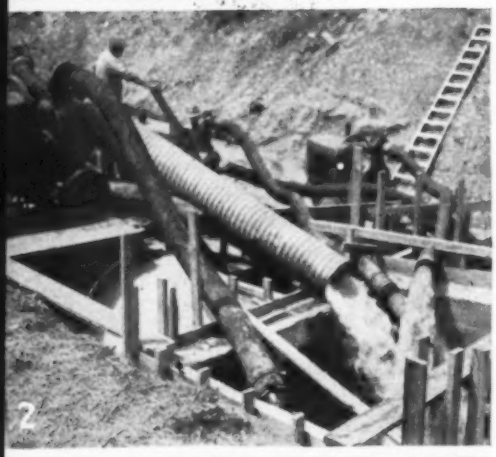
W. J. CALLAHAN
Assistant Sewer Superintendent

ELDON BERRY
Fine Grading Superintendent

R. W. STOCKMAN
Comptroller

JOHN LISTON
Payroll Auditor

JOHN KELLY
Equipment Supervisor and Purchasing Agent



an emergency measure, but fortunately the services of the medical corps men were not needed at any time. Not a single snake bite was recorded.

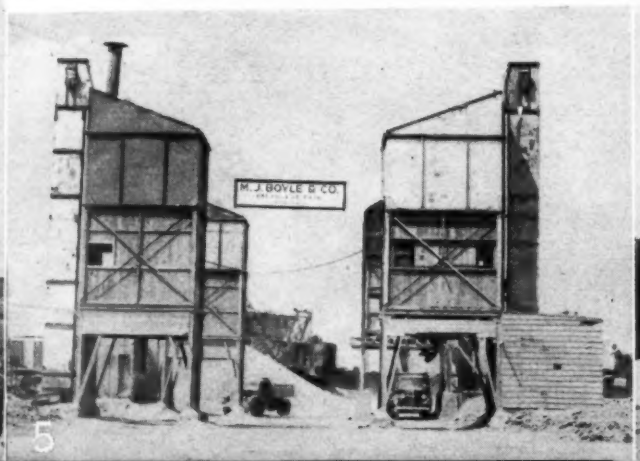
The first sewer work was started April 26 when, due to the proximity of the ground water, a 20′ x 20′ sump was dug to a depth of six or eight feet below the depth of the water table at the outfall structure in Ditch No. 1. Water was pumped over a dam to the outfall ditch. It required three 8-inch and six 6-inch pumps to lower the water table sufficiently to permit the laying of twin 48″ concrete pipe in the dry in compliance with specifications. Specifications required that all pipe be layed in the dry. The trench in which the pipes were laid, at the outfall structure, was about 14 feet deep. The bottom of the trench was dug to a width of 26 feet and the banks were sloped on a 1/1 slope. (See drawing, page 561) This permitted the construction of a lateral drainage trench, two feet below the flow line of the pipe, paralleling the sewer line, but sufficiently clear of the sewer line to not disturb the bearing for the pipe. This sub-ditch was connected to the sump at the outfall structure. Secondary sumps, from 4′ x 4′ to 10′ x 10′, were necessary at junctions along the line as work progressed away from the outfall structure. A similar method of construction, with a sub-trench and sumps, was employed on all of the four main sewer systems since the outfall of the four systems varied from two feet to six feet below the existing ground water table.

Start Pipe-laying Operations

The first sewer pipe was laid on May 1, starting at the outfall of the twin 48″ sewer line that crossed the entire airfield and drained the northeast apron extension, which was the first paving work scheduled on the job. Ditching operations were carried on simultaneously in other areas with pipe-laying operations in this area.

To prevent any possible airplane flight hazards, no open ditches were permitted to within about 500 feet of runways. Due to the flatness of the terrain and the proximity of the Mad River, it was necessary to employ four independent drain systems. The largest of these four drain systems involved twin 72-inch pipes in the outfall line draining into Ditch No. 1; a single 54-inch line draining into Ditch No. 2; twin 48-inch lines into Ditch No. 3, and a single 60-inch line into Ditch No. 4. Amounts and sizes of pipe, all of which was reinforced concrete, used on the job are as follows: 16,700 feet of 12″; 8,000 ft. of 15″; 5,000 ft. of 18″; 6,500 ft. of 21″; 6,000 ft. of 24″; 4,000 ft. of 27″; 3,500 ft. of 30″; 3,500 ft. of 36″;

• 1—One of two 48-inch concrete pipe lines laid in the dry with lateral drainage trench two feet below flow line of pipe to the right. Manhole can be seen connected to pipe in center of picture, indicating eventual grade. 2—Four pumps used to carry water from secondary sump into a 60-inch line as work progressed away from the outfall structure. 3—Bucyrus-Erie 1½-yd. dragline with 40-ft. boom and 10-ft. extension ditching for drainage. 4—Lima 1-yd. machine with 50 foot boom used for laying concrete pipe. 5—Two of the three 300-bbl. Blaw-Knox dry cement bins at the batch plant. 6—Semi-permanent washer plant erected by Central States Construction Co. 2-yd. Northwest clamshell used in aggregate pit is in the foreground. The Allis-Chalmers tractor with bulldozer is used for cleaning up.



7,000 ft. of 42"; 10,500 ft. of 48"; 900 ft. of 54"; 2,500 ft. of 60"; and 2,900 ft. of 72".

In a section of drainage system No. 4, where the minimum cover required for reinforced concrete pipe could not be obtained, approximately 5,000 linear feet of corrugated metal pipe, ranging in size from 15" to 24", was used.

In the construction of the sewer program 43 pieces of equipment were used, including 10 combination cranes and draglines, four bulldozers, two concrete mixers and 27 centrifugal pumps. The cranes varied in capacity from ½ to 2½ cu. yds., and consisted of the following: One 2½-yard Northwest; one 2-yard Northwest; two 1½-yard Northwests; two 1½-yard Bucyrus-Eries; one 1-yard Lima; one 1-yard Northwest; two ¾-yard Bucyrus-Eries and one ½-yard Bucyrus-Erie. Four Caterpillar tractors with LeTourneau bulldozers consisting of a D-4; D-6; D-7 and a D-8 were used for backfilling and compacting of backfill in the sewer trenches. The concrete mixers, consisting of one 27-E Ransome paver, and one 10-S Ransome mixer were used on pipe encasement work, together with the construction of over 200 auxiliary structures in the drainage system. Six each of 2-inch; 3-inch; 4-inch and six 6-inch and three 8-inch pumps of various types and makes were used in combating the water problem already described.

All excavation, including ditching, peat removal, wasting, borrow and general grading, was subcontracted by the Raemisch-Madden Co., a combination of the firms of Henry Raemisch of Middleton, Wis., and Thomas Madden of Chicago. Raemisch-Madden Co., in

(Continued on page 561)

Equipment Used at Patterson Field

POWER SHOVELS, CLAMSHELLS, DRAGLINES

1—Bucyrus-Erie 15-B, ⅜-yd. shovel with clamshell and dragshovel attachment.
1—Bucyrus-Erie 20-B, ¾-yd. dragline and clamshell with 40' boom.
1—Bucyrus-Erie 20-B, ¾-yd. clamshell, dragline and dragshovel with 45' boom.
2—Bucyrus-Erie 22-B, ¾-yd. dragline and clamshell with 45' boom.
2—Bucyrus-Erie 33-B, 1¼-yd. draglines and clamshells with 55' booms and independent boom hoists.
1—Bucyrus-Erie 37-B, 1½-yd. dragline and clamshell with 55' boom.
1—Koehring 604, 1½-yd. dragline, shovel and clamshell.
1—Koehring 303, ¾-yd. shovel.
1—Link Belt K 480, 2-yd. dragline with 60' boom.
1—Marion 381, 2-yd. dragline with 60' boom.
1—Northwest No. 6, 1½-yd. dragline with 60' boom.
2—Northwest No. 5, 1½-yd. draglines with 45' booms and 1 shovel dipper.
1—Northwest 85, 2½-yd. dragline with 65' boom.
1—Northwest No. 8, 2-yd. dragline with 60' boom.
2—Northwest, Model 4, 1¼-yd. draglines with 45' booms.
1—Northwest, 1-yd. dragline and shovel.
1—Bucyrus-Erie 33-B, 1¼-yd. dragline with 50' boom.
1—Bucyrus-Erie 37-B, 1½-yd. dragline with 40' boom, and 10' extension.
1—Lima No. 650, 1-yd. dragline with 50' boom.
1—Unit 1020, ¾-yd. shovel.
2—Lorain, 1¼-yd. shovels.
1—Manitowoc, 2-yd. shovel with dragline attachment.

PAVING EQUIPMENT

7—Mack tank trucks, 2,000 gallon capacities.
3—Ford tank trucks, 1,200 gallon capacities.
45—Batching trucks.
4—Ransome 34-E Dual Drum pavers.
1—Ransome 27-E single drum paver.
3—Jaeger transverse finishers.
2—Koehring longitudinal finishers.
1—Blaw-Knox, transverse finisher.
(The finishers are all 24' to 26' in width.)
1—Buckeye R-B finegrader, Model 357.
2—Cleveland trail graders.
2—Cleveland form graders.
1—Lakewood sub-grader.

PUMPS

65—1½" to 8" pumps including: C. H. & E.—Jaeger—Novo—Sterling—Ingersoll-Rand—Domestic Plunger and Barnes.

LIGHT PLANTS

About 28 Kohler light plants, mostly 1½ kw; two Universal, 5 kw; two Pioneer, 1 kw; seven Master, 5 kw and 7½ kw; two Nighthawk, 5 kw, and one Allis-Chalmers, 5 kw.

BATCH PLANT EQUIPMENT

1—Butler, 450 bbl. cement bin.
3—Blaw-Knox, 300 bbl. cement bins.
4—Blaw-Knox, 105-ton aggregate hoppers.
1—Caterpillar Generator.

GRADING EQUIPMENT

1—International TracTracTor, Model T9.
1—Bucyrus-Erie Bullgrader, 9' blade.
1—Allis-Chalmers patrol grader, 12' blade.
2—Caterpillar No. 50 tractors with one LaPlant-Choate bulldozer.
1—Caterpillar high-lift end-loader.
1—Caterpillar No. 35 tractor with LeTourneau bulldozer.
1—Caterpillar D8 tractor with LeTourneau bulldozer.
7—Caterpillar D8 tractors.
2—Caterpillar D7 tractors with LeTourneau bulldozers.
5—Caterpillar D7 tractors.
2—Caterpillar D6 tractors with LeTourneau bulldozers.
3—Caterpillar D4 tractors with LeTourneau bulldozers.
1—Caterpillar D2 high-lift.
2—Caterpillar No. 60 tractors.
1—Cletrac tractor.
1—Allis-Chalmers Farm tractor.
1—Caterpillar motor patrol, 12' blade.
2—LeTourneau 18-yd. scrapers.
12—LeTourneau 12-yd. scrapers.
1—LeTourneau 9-yd. scraper.
1—Heil 15-yd. scraper.
1—Allis-Chalmers HD14 tractor.
1—Allis-Chalmers HD10 tractor.
1—Allis-Chalmers Model L tractor.
1—Caterpillar overhead loader.
1—Allis-Chalmers elevating grader.
6—Tournapulls, Model Super C.
1—Drott bulldozer, 10' blade.
3—LeTourneau bulldozers, one 11', two 12' blades.
2—LaPlant-Choate bulldozers, one 12' and one 11' blade.
3—Caterpillar No. 12 patrols, 12' blades.
1—Gallion patrol with 12' blade.
1—Austin-Western patrol with 13' blade.
3—Double drum sheepsfoot rollers, 1 Heil, 1 Euclid and 1 Bros.
1—Austin-Western 3-wheel 10-ton roller.
1—Amsco cable control loader.

TRUCKS

121—Trucks (including Internationals, Fords, Sterlings, Reos, Macks, Hendersons, ranging in size from 4 yds. to 10 yds. Also tank trucks, dry-batch dump trucks, sprinklers, and general hauling dump trucks).

Post-War Highway Planning

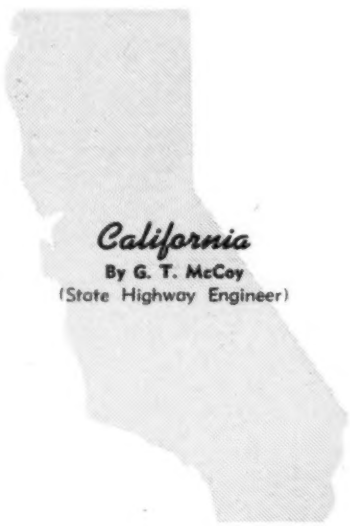
II

This second of a series of articles on state post-war highway planning programs gives the situation existing in California, Connecticut, Kansas, Kentucky, Minnesota, Mississippi, New Jersey, North Dakota, Oklahoma, Virginia, West Virginia and Wisconsin

STATE HIGHWAY departments are determined to be ready to start their respective post-war highway improvement programs immediately following peace day in spite of present war-time detriments. Most of the states lack adequate engineering personnel, especially draftsmen and survey parties, to do all they would like to complete their post-war programs. Many are meeting this problem by hiring women for some of this work. In California, for instance, girls are used for survey work.

Some of the states lack adequate finances to go ahead with an "all out" program and in other states there is the lack of necessary legislation. But in spite of these drawbacks plans in general are going ahead in a satisfactory manner.

In this, the second of a series of articles on post-war highway planning, EXCAVATING ENGINEER presents the results of a survey conducted in another group of states in all sections of the country.



California

By G. T. McCoy
(State Highway Engineer)

It is impossible at this time to give a complete picture of the California post-war highway program because it is now in the course of preparation rather than in a completed form.

We have available an appropriation of $12,000,000 made by the legislature at its last session, and approved by the Governor, for the preparation of plans, estimates, and specifications, and for the acquisition of rights of way on projects for construction in the post-war period. We have also available, approximately $2,000,000 of regular federal aid, set aside under the provisions of H. 2798, recently passed by Congress and approved by the President, for preliminary engineering.

Certain preliminary engineering work is now under way and we have projects in sufficient number, consisting of urgently needed improvements, expansion of highways to meet increased volume of traffic, and development of major arteries, such as freeways into and through metropolitan areas, that will require several years of work to bring to a completed plan

stage, and with rights of way acquired.

Our situation is somewhat complicated by the fact that the reduction in engineering personnel has been large—at least 30%—and we have a comprehensive program of access road and flight strip construction, which we are carrying on for the federal government. In the past year, about $20,000,000 worth of work has been constructed, or is now in the course of construction, and approximately $8,000,000 more is in the stages of either being advertised for bids, just awarded to contract, or being prepared for such action. Until this program of access road construction has been pretty well cleared up, the majority of our remaining personnel will be engaged in that work, and our plan program will proceed more slowly.

We have now approximately six to ten million dollars worth of plans ready, with many others well along toward completion. We have acquired rights of way on quite a number of projects and would, therefore, be in a position to proceed with a fairly comprehensive program of construction if hostilities would cease tomorrow.

We are making every effort to increase the number of our engineering personnel. We are engaging women for drafting work, and are even using girls on our survey parties. The amount of plan work, and right of way which we acquire, will only be limited by the number of employees available for working on these projects.

The legislature also appropriated $1,500,000 for the preparation of plans for post-war work on county roads. This money may also be spent on important city projects which connect with the country road system. The State Department of Public Works is allocating these funds in accordance

The status of post-war planning programs in 12 states—Alabama, Indiana, Illinois, Nebraska, New Hampshire, New York, Ohio, Pennsylvania, Rhode Island, Texas and Vermont — was published in the October, 1943, issue of EXCAVATING ENGINEER.

How You Can Help

Reports coming from state highway departments to Excavating Engineer give good grounds for optimism about a quick getaway for post-war highway employment. These reports indicate a full understanding of the problem and an earnest desire to complete promptly all preparations for letting necessary projects. The states with advanced plans have many millions of dollars of work which would be ready to let if the war ended tomorrow. Plans for numerous other projects will be completed in coming months . . . despite the country-wide shortage of designing engineers, surveyors and draftsmen.

However, the preparations already made are only a start on the program we should have ready to go on peace day. In some states, enabling legislation and appropriations are still needed. In others, legal details and right-of-way acquisition are bottlenecks. And some states have been harder hit than others by the lack of skilled help necessary to prepare practical, detailed plans.

These obstacles can be overcome. With the active help of everyone connected with the highway industry, the splendid progress already made by many states can be continued, and other states can be given a real boost toward an adequate program for immediate post-war lettings.

Here are some things you can do to help:

1. **Check over all the competent highway-design engineers, surveyors and draftsmen you know, regardless of age or present employment. Write your state highway department of any you think might be available. Give as much information as possible about the ability and present circumstances of each man.**
2. **Canvas your own organization for men with similar qualifications. Check the possibility of loaning any qualified men to the state highway department for any period you can spare them — a month, three months, six months. If the state can't meet the salary you pay, perhaps you can arrange to make up the difference, by charging it to the standby expense of maintaining your organization, or by getting a group together to underwrite the difference.**
3. **If legislative action is required in your state, fully ascertain the facts and requirements and get busy writing and talking to your representatives, to your friends, to your associations, and to the newspapers about what should be done and why. And KEEP AFTER IT.**

Our fighting men are going to feel much happier if they come back to honest and constructive jobs instead of to an unemployment handout or a leaf-raking dole—and the manpower required to keep our post-war highway plans moving will not hurt the war effort.

We now have raised industrial activity, employment, and average individual income above any previous experience in our history. But this is an artificial level, set by the demands of war, and — impossible to sustain for long because it is based on borrowed capital with no provision for repaying, or even maintaining, the ever increasing debt.

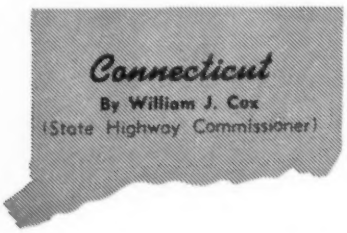
If we can shift over smoothly to constructive production when the war ends, we have a good chance to maintain and improve our present high level of employment and national income on a sound and profitable basis. If we fail to mesh the gears and the machine of business must slow down to a standstill for a new start, we may find ourselves unable to meet payment on the checks that have been written against the bank of American industry.

Needed and useful highway and airport construction is one of the best opportunities for filling employment needs through the period of industrial re-tooling and re-adjustment to peacetime production. We should all help the highway departments to do this job with maximum effectiveness.

This is vitally important to you and your business. It's also vitally important to your community and the nation.

with the provisions of the enactment, the counties making up their recommended programs of projects.

It is impossible to make any statements concerning funds available for construction, either for state highways or county roads, at this time. The program of preparation of plans and acquisition of right-of-way for post-war construction is a program in itself, and simply provides a reservoir of projects so that when, and if funds become available after hostilities cease, immediate construction may proceed.



The Connecticut State Highway Department is now engaged in developing a comprehensive post-war construction and reconstruction program. The plans will provide modernization of the older parts of its 3,000 mile state highway system and will permit the construction of needed new components in that system. Taking into account all developments deemed necessary, not only to catch up with existing needs, but to anticipate reasonable future needs, the program now appears to encompass $243,000,000 worth of improvements.

The selections were made first on a basis of pre-war congestion requiring prompt remedies and second to meet mounting pre-war traffic totals which indicate traffic saturation in the days immediately after the war when normal motor vehicle travel and manufacture may be expected to resume.

The most pressing part of the program is now receiving full attention from the engineering forces of the Connecticut State Highway Department and the department's head. Plans and specifications have been completed for more than $7,000,000 worth of work and by the end of 1943 additional plans will have been completed to bring this total to well over $13,000,000.

Beyond the point covered by this advance planning it is anticipated that a special Highway Advisory Commission, set up by the 1943 session of the Connecticut General Assembly, will share in the consideration and development of subsequent parts of the program.

To provide a more understandable picture of the whole problem it seems wise to outline briefly the method of financing the Connecticut State Highway Department. After the cost of collection and a $500,000 appropriation to the State Police Department, the net income of the Motor Vehicle Department is earmarked for highway purposes. There are several fixed charges, including bond service, and an annual appropriation of $4,000,000 for the construction and maintenance of town roads. What remains is subject to the operating charges of the highway department, including maintenance of the state system as nearly as possible to pre-war standards.

From the foregoing it can be seen that financing advance planning requires careful distribution of the greatly reduced balance in the construction account. The advance planning comprises preliminary field surveys, actual field location work, design, right-of-way acquisition and, finally construction. The Connecticut Highway Department is trying to maintain a wise balance between the planning needs and the post-war construction requirements of matching money for federal funds and the complete cost of purely state undertakings.

Outstanding among the projects upon which planning is now being concentrated is an all-vehicle express highway in Fairfield County set up by special act of the last session of the General Assembly. This highway will connect with the Pelham-Port Chester express highway in Westchester County, New York, but will serve the prime purpose of connecting the towns and cities of southern Fairfield County and at the same time remove the heavy flow of interurban travel from the streets of the communities now traversed by the Boston Post Road.

Plans are well advanced for the balance of the Wilbur Cross Parkway from its present junction with Derby Avenue in Orange to a point north of Meriden. Completion of these sections in this area will provide a four-lane divided thoroughfare from the center of Hartford to the New York State Line. Paving is the only operation remaining at the north end of this improvement.

East from the Charter Oak Bridge, plans are practically complete for the remaining sections of the Wilbur Cross Parkway needed to connect with the existing sections beginning at Tolland Station.

For a considerable period of time it has been recognized by the Highway Department that Route U. S. 6 for almost its entire length between the New York State Line and Hartford has been unsatisfactory for the traffic it carries. Recent improvements in Southbury, completed in 1942, constitute the first steps in the modernization of the route. Plans are being prepared for a section in Newtown and Southbury extending southwest from the above mentioned improvement and including a new bridge crossing of the Housatonic River.

From Southbury center northeast toward Hartford the character and location of the improvements are tied in with the developments under consideration for the Waterbury area and for the Hartford-New Britain express highway.

Studies are being made in Waterbury and vicinity looking toward the development of a comprehensive plan for the movement of traffic in and out of that city on the main routes. Here, too, some improvements have been made and others await the end of the war and needed funds.

The north central areas of the state are being considered in the planning operations for the continuation of the Hartford By-pass, which serves to carry Wilbur Cross Parkway traffic into the center of Hartford. By the development of the remainder of

Above — Bridge being constructed by the Kentucky Highway department over the Kentucky River at Clay's Ferry will be the highest highway bridge east of the Mississippi River. The present bridge can be seen in the background.

Above Right — Work during the widening of an access road to Fort Dix, N. J. A new bridge on the widened section is on the left and in the center is the present bridge on the original part of the highway. Later the original bridge was raised as a unit nearly eight feet vertically so as to conform to the new elevation of the widened highway.

Right — Combination railroad-highway grade separation in Waite Park near St. Cloud, Minnesota. U. S. Highway No. 52 is carried over head, the railroad and T. H. No. 3 underneath.

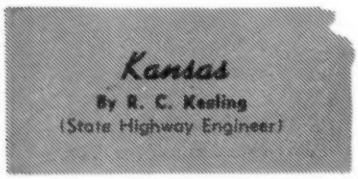
Below — The Connecticut Highway Dept. last year completed the installation of a dual lane highway on route U. S. 5, between Hartford and Meriden, one of the busiest highways in the state. When the Wilbur Cross Parkway is extended from its present terminus in Orange, it will eventually connect with U. S. 5 at the Meriden end, providing a "double barrel" highway from Hartford to the New York State line.

Below Right — Proposed City of San Francisco El-Way planned by the Donald Warren Company for The Metropolitan Developers who have formed a foundation to make a study of the project which is intended to decentralize the present commercial area. The El-Way is a six-lane divided elevated highway which forms a loop about the heart of the San Francisco business district. It has long sweeping curves and gentle grades. Ramps to and from the roadway are provided at various intervals.

the dike area on Hartford's river front it is possible to continue the flow of north and south traffic around the heavy local traffic in the capitol city.

The ultimate completion of these highways with feeder roads that are also on the larger program of the department will, as can be seen, give prompt and satisfactory connection between almost all of the areas of the state. These roads, when improved, will substitute modern highways for obsolete routes — handling the large volumes of post-war traffic with ease, convenience and economy for the motor vehicle owner.

In brief, it might be said that Connecticut is now partly ready and soon will complete the job of preparation.



At the present time we have final construction plans completed covering approximately $10,000,000 worth of highway and bridge construction projects. However, right-of-way has not been secured on a large portion of this proposed work. Surveys are complete and plans are partially complete on an additional $5,000,000 worth of work, and work is proceeding on the final completion of these partially completed plans. Field surveys have been made on projects with a proposed construction cost of approximately $13,000,000.

Approval has been received covering our advance engineering program as set out in the Highway Defense Act of 1941, and we are at the present time preparing an advance engineering program request in order to utilize some of the funds for post-war planning as provided for in Public Law No. 146, as approved July 13, 1943.

There is a serious shortage of engineers in our Department at this time which is slowing up the progress of final completion of plans, but it is our intention to continue work on detailed post-war plans to the extent of our available manpower.

Local government agencies are much interested in proposed post-war projects, but at the present time there apparently has not been a great deal of work done by these local agencies toward the preparation of detailed plans for immediate letting of projects. They, like us, are confronted with the shortage of engineers necessary to carry on detailed planning due to so many of these engineers being employed in war industries and due to the large number who have entered the armed services.

We hope to be able to have a large amount of completed plans ready for the post-war period so as to be able to let contracts covering our unobligated Federal aid funds and be in a position to take advantage of probable future Federal aid allotments for this post-war period.

Under the authorization for advanced engineering projects, we have had 19 projects approved and have a good part of the field work done on them. Considerable progress has been made in the preparation of plans and we are now endeavoring to have final check made on the plans and start the acquisition of the right-of-way. These projects cover approximately $20,000,000 of the construction cost.

In addition to the work done under the advanced engineering set-up, we are having our District Engineers submit programs from their districts on needed work. These programs were discussed at a meeting of District Engineers and the Commissioner of Highways in Frankfort on September 7, 1943. As an additional check on the program of needed projects our Highway Planning Survey is also listing results of their study and our Bridge Engineer is preparing a list of sub-standard bridges. From these sources, we will endeavor to pick a definite program to concentrate on in line with the proposed post-war highway bill now before the Committee in Congress. As an additional check we have a 15-year program which was prepared in 1938.

We sincerely believe that when these various programs are consolidated, we will have a very accurate account of the highway needs in the State and we will concentrate our efforts on enough of these projects to utilize the suggested allotments indicated by HR 2426.

We are also contacting cities and counties for their suggestions but do not know of any separate planning being done by these political sub-divisions beyond their request to us. We do know, however, that the Planning Commission of Louisville is working on a program.

When we try to take stock of the post-war construction outlook, we find that finances are the unknown quantity which make it difficult to predict how much work can be undertaken within a given time or how soon a maximum program can get under way. The Minnesota Department of Highways now has plans completed or in preparation for work exceeding the known available funds. In the case of some other agencies, uncertainty as to finances is to some extent holding up the making of plans and surveys.

On September 1, 1943, the State Department of Highways had plans and specifications completed for 409 miles of grading, 29 miles of paving, 95 miles of gravel base and bituminous treatment, 89 miles of bituminous treatment, 20

miles of roadside development, and 29 bridges. The estimated cost of the projects for which plans are completed, plus the estimated completion of projects for which plans are in progress, is somewhat in excess of $20,000,000.

Recently we set up a definite schedule of projects on which plans and specifications are to be completed by October 1, 1944. This schedule is set up so as to give an equitable distribution of work in all sections of the state, and also set up so as to give a proper distribution of various types of work. This program is to be broken down into 12 increments of work, the first increment to be completed November 1, 1943, and one additional increment the first of each following month. By this type of planning we hope to avoid any bottlenecks so far as plans are concerned.

Under this schedule we expect to have completed, by October 1, 1944, plans and specifications for 600 miles of grading, 240 miles of paving, 360 miles of gravel base and bituminous treatment, 300 miles of bituminous wearing surface, and 120 miles of pavement widening, in rural areas and places of less than 10,000 population. This is inclusive of the projects before listed on which plans are already completed. The program will also include all bridges necessary in connection with the above work, and a list of bridges programmed for construction independent of this work. We are also attempting to develop a special program in cities of 10,000 or more, but how far we can progress with this work depends on our ability to get the necessary technical help.

We would therefore be in position to start advertising for bids anytime after the war ends, whenever men, materials, equipment and funds are available. Under our laws we must advertise for bids three weeks, and it usually takes a week or two after bids are opened before the formalities of executing contracts can be completed. Actual construction could therefore get under way in a little over a month, if the season permits. There should be little danger of delays due to legal details concerning right-of-way. On some projects we have already started acquiring right-of-way, and on all others we are preparing the right-of-way proceedings while plans are in preparation. Under the Minnesota law construction can be started as soon as condemnation proceedings have been filed.

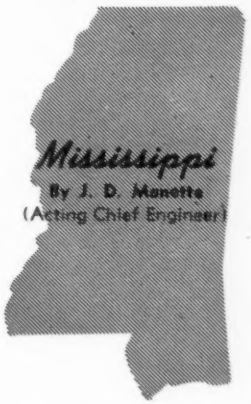
Finances may be a more serious problem. Minnesota has set aside $10,000,000 as a reserve for post-war construction, and deferred allotments of federal aid totaling $500,000 will be available. Although construction is greatly curtailed, we will be able to add little if anything to our post-war reserve during the current fiscal year, since maintenance, debt service and other fixed charges will require the greater portion of our current income. Our receipts for the fiscal year ended June 30, 1943, were 25 per cent under our income for the preceding year, and income for the current year will be considerably less. If the war should last more than another year, it may be necessary to dip into our reserve for current needs.

Neither can we count on an immediate return to our former income when the war ends. Income from motor vehicle registration will continue to decrease after the war until manufacture of motor vehicles has progressed to a point where an increased registration results. Income from motor fuel taxes will increase with the discontinuance of rationing but the increase will not be rapid until an ample supply of tires is available. Provisions for additional federal aid funds is, therefore, urgently necessary in order that finances may not be the most serious bottleneck after the war ends.

No detailed survey has been made, and only a general statement can be made of post-war planning by counties, cities and townships. We know from our contacts with county highway engineers and county boards that nearly all of them have given some attention to post-war planning, but the number of counties that have some plans completed or in progress is relatively small.

Some of the cities have done considerable post-war planning, but the greater part of it is on projects to be built in cooperation with the State Highway Department, on arterial streets which are part of the trunk highway system.

The Highway Department, through our District Engineers and other administrative personnel, is endeavoring to encourage counties and cities to make surveys and prepare plans for post-war construction. We are also cooperating with other agencies in developing local popular support for an extensive post-war construction program.



We already have on hand in various stages of completion a considerable number of projects, as well as notes on several completed surveys. We do not believe that it will take long to complete a number of these in order that contracts may be let promptly at the cessation of hostilities. There are also several graded and drained projects ready for paving which could be let to contract with very little delay. We estimate that we could let about a million dollar's worth of work during the first 30 days with a gradual increase each month over this amount.

We are not attempting to obtain any rights-of-woy at this time since our funds are quite limited and our revenues have dropped to a point where we are operating on a reserve which has been built up during the past two years.

Our laws do not permit us to

(Continued on page 568)

John Everett Ballenger

John Everett Ballenger, 59, Lakeland, Florida, road contractor, died at Morrell hospital, in Lakeland on September 12. He had been in ill health for more than a year but had not been entirely inactive. He was suffering from a heart ailment when an appendectomy became necessary. He failed to survive the operation.

Born in Virginia, Mr. Ballenger attended public schools and the McKinley Manual Training school in Washington, D. C., and later was a student at Lehigh University. In 1905 he became an assistant engineer in the highway department of the surveyor's office of the District of Columbia. He continued in that position until he went to Florida in 1911 to accept a position as engineer of highways and assistant commissioner of public works for the city of Jacksonville.

Mr. Ballenger left Jacksonville in 1917 to assume charge of all road construction at the naval operating base at Hampton Roads, Va., and in 1918, he became associated with John Gill and Sons of Cleveland, monumental builders, who constructed the Lincoln Memorial and post-office buildings in Washington. Mr. Ballenger also supervised the construction of the federal reserve bank building in Cleveland.

He returned to Florida in 1922 and became general superintendent for the William P. McDonald Construction Company. He became a resident of Lakewood in 1924 and founder of the Ballenger Construction Company in 1930. In 1936 he took over the agency of the American Oil Company in Lakewood and also opened the Ballenger Auto Storage, Inc. He and his associates bought the New Florida hotel in 1940.

Mr. Ballenger was married to Miss Ruth Nolan in Washington, D. C., in 1913. Survivors, in addition to his widow, are four daughters, Mrs. Edward H. Doyle, and Misses Helen, Betty and Charlotte Ballenger; his mother, Mrs. L. E. Ballenger of Washington; a sister, Miss L. E. Ballenger of Washington, and a brother, Captain T. P. Ballenger of Philadelphia.

Mr. Ballenger was an active civic leader of Lakeland. He was an honorary member of the Rotary club and a member of the Elks lodge. For several years he gave a barbecue at his home, "Forty Acres", in honor of the Detroit Tigers at the close of their training seasons in Lakeland. He was especially well known for the consideration he manifested toward his employees, who responded with strong loyalty.

John Phillips

The life of the late John Phillips of Oakland, California, is typically American. It is the story of a barefooted farm boy who leaves home at an early age and finally achieves success in a field of endeavor of his own choice solely through his all-consuming ambition, native ability, hard work and rigid honesty.

Mr. Phillips was born in Ontario, Canada, on October 8, 1882. One of a family of five children he was called upon early in life to work long hours on his father's farm which had been homesteaded by his grandfather. When only 15 he left home to earn his living. He worked on various jobs in Alberta and three years later was chief engineer of a sawmill in Vancouver, B. C.

In 1905 Mr. Phillips came to California and took an engineering job with the Jersey Land Company doing land reclamation work.

Mr. Phillips went into partnership in 1913 with D. A. Cannon and formed the Cannon-Phillips Company and acquired the Sacramento Clay Products Company. Mr. Cannon took charge of sales and Mr. Phillips ran the plant where he installed several revolutionary improvements, including a sand-gathering device and a new method of molding and firing red curved roof tiling which resulted in better firing, less breakage and more tile per given unit of time. He improved the design of pug mills then in use and he also experimented on different layouts for using draglines to remove clay from nearby pits. All of these improvements combined reduced the cost of clay products by about 25 per cent.

In 1917 the first World War was putting a virtual end to building and so Mr. Phillips sold his interest in the Cannon-Phillips Company and set himself up as a dragline contractor. From a modest beginning his business grew and prospered. Again he was busy planning improvements in machinery and methods. Many of the improvements suggested by him were accepted by equipment manufacturers.

As a dragline contractor Mr. Phillips pioneered and developed

(Continued on page 560)

WRITING A NEW CHAPTER IN TRANSPORTATION

A new era of bygone days was represented by the "American Express Train" of 1855, here pictured by the famous lithographer, Nathaniel Currier. In 1869, that era culminated in the completion of the first transcontinental railroad.

Railroads are facing their biggest test in moving today's record volume of freight. GM Diesel freight locomotives are helping the Seaboard to do its part in meeting this emergency.

The war record of the railroads is a remarkable story of transportation.

And potent new factors in writing this story are General Motors Diesel Locomotives.

Tough, tireless freight Diesels are hauling war loads faster, and with rare economy of precious fuel.

They are adding a new chapter to America's story of railroading, and demonstrating that today's achievements are the first great step in a new era of transportation.

Reconstruction and new construction are going to need plenty of this hard-hitting, easy-on-fuel power. With normal refinement and development speeded up by war, with production expanded, GM Diesels will be ready to serve in more fields and in more ways than ever.

★

BACK THE ATTACK—
WITH WAR BONDS

GM
GENERAL MOTORS
DIESEL POWER

LOCOMOTIVES.....*ELECTRO-MOTIVE DIVISION, La Grange, Ill.*

ENGINES..*150 to 2000 H.P.*...*CLEVELAND DIESEL ENGINE DIVISION, Cleveland, Ohio*

ENGINES.....*15 to 250 H.P.*.....*DETROIT DIESEL ENGINE DIVISION, Detroit, Mich.*

Shots from the FIRING LINE

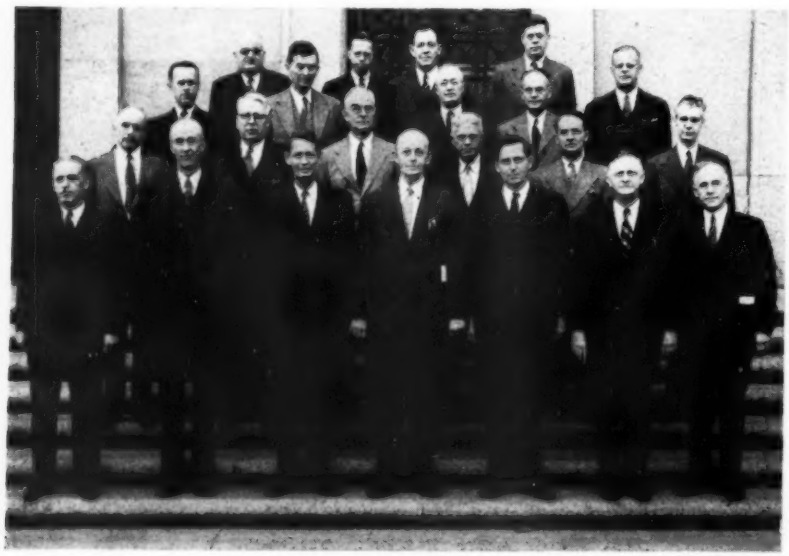
Urge Increased Production of Machinery Repair Parts

An urgent appeal to manufacturers of construction equipment to increase production of repair and spare parts was issued by the War Production Board's Construction Machinery Division. Present output of parts is at the rate of 50 per cent of the total dollar value of equipment produced, while peacetime output of parts was at the rate of 15 per cent of total production, by dollar value. Despite this increase, not enough parts are being produced to meet present requirements, Division officials said, and 1944 demand is expected to be even higher. Most urgently needed are parts for power shovels and cranes.

The abnormally high demand for parts is due to several factors: Approximately 95 per cent of new cranes and shovels are used for military work overseas and at home. These items are shipped overseas with spare parts to the amount of 25 per cent or more of total value to provide for adequate maintenance.

At home, where only five per cent of new cranes and shovels and only about 10 per cent of all new construction machinery are available for civilian purposes, a large amount of second hand equipment has been pressed into service, with resultant increase in the need for maintenance parts. Moreover, equipment at home is being operated 18 to 20 hours daily instead of the normal 8 to 10 hours, and an added factor in increased demand for repair parts is the lack of experienced operators, many of whom are now in the Armed Services.

In an effort to increase production of parts, the construction machinery industry is using subcontracting to an ever greater extent. Available facilities of the machine tool industry are being used in particular. The output of heavy spare parts, machined from castings, is hampered by manpower shortages in steel foundries.



• Conferences of the branch and regional directors of the Bureau of Reclamation under the decentralization plan were held at the Department of the Interior, Washington, D. C., last month to discuss reorganization procedures. Attending the conferences were, from left to right: Front Row—W. F. Kubach, director of fiscal and administrative management; S. O. Harper, chief engineer in charge of branch of design and construction; John C. Page, consulting engineer; H. W. Bashore, commissioner of reclamation; W. E. Warne, assistant commissioner; John S. Moore, director of operation and maintenance; E. B. Debler, director of project investigations;
Second Row—E. A. Moritz, director of Region No. 3; C. E. Carey, director of Region No. 2, F. A. Banks, director of Region No. 1; H. D. Comstock, director of Region No. 6; E. O. Larson, director of Region No. 4; W. R. Nelson, director of Region No. 5;
Third Row—L. J. Moran, assistant director of fiscal and administrative management; R. J. Newell, assistant director of Region No. 1; L. J. Foster, assistant director of Region No. 3; R. S. Calland, assistant director of Region No. 2; L. R. Smith, assistant director of fiscal and administrative management;
Fourth Row—G. W. Lineweaver, chief of information, J. K. Cheadle, chief counsel; J. C. Thrailkill, chief clerk, Yuma, Ariz.; H. R. Stinson, assistant chief counsel.

Highway Research Board Meets November 27-30

The Twenty-third Annual Meeting of the Highway Research Board, will be held at the Edgewater Beach Hotel, Chicago, Illinois, November 27-30, inclusive.

The first two days, November 27 and 28, will be devoted to meetings of the various committees and departments.

Sessions of the Board for the presentation and discussion of papers relating to highway finance, economics, design, materials, construction, maintenance, traffic and soils investigations will be held on Monday and Tuesday, November 29 and 30.

According to R. W. Crum, director of the Board, it is expected that time and travel facilities will be greatly conserved by holding this meeting contiguous to that of the American Association of State Highway Officials which will be held immediately following at the same hotel.

Salted Runways Feature of Army Air Base

Salted runways are a feature of a western Army Air Base, which has been in operation only a short time.

Recent award of an Army-Navy "E", made to the contractors for completing ahead of schedule the Mountain Home, Idaho, Air Base, disclosed a unique feature of the construction.

In order to keep work going on the mammoth runways through last winter, the contractors built their own brine plant to dissolve salt in the water used for grading and surfacing operations. 1840 pounds of salt to each 1000 gallons kept the water from freezing. Altogether 59,950,000 gallons of water were used in the project.

Like all other military construction, the Mountain Home project was supervised by the Corps of Engineers, Army Service Forces. It is one of nearly 700 air bases in the United States on which Engineer construction was undertaken during the past fiscal year.

Reports on Deliveries of Construction Equipment

"Next year we're going to call for $825,000,000 worth of equipment. That's just 6 per cent under 1943. The rest of this year we must step up deliveries considerably to meet our objective. We may reach it and we may fall a little behind.

"August deliveries of construction equipment ran to $18,000,000, and we'll have to reach $20,000,000 a month this year to meet our objective. We've been getting more production each successive quarter this year and next year

for THIS battle, G.H.Q. is at YOUR own desk!

★ Here's how you—yes, YOU—can carry out a smashing "pincer movement" against the Axis. Swing in on one flank with increased production of war goods! Drive in on the other with redoubled purchases of War Bonds through your Pay-Roll Savings Plan!

You're an officer in both of these drives. Your personal leadership is equally vital to both. But have you followed the progress of your Pay-Roll Savings Plan as closely as you have your production?

Do you know about the new Treasury Department quotas for the current Pay-Roll Allotment Drive? *Quotas running about 50% above the former figures?* You see, these new quotas are based on the fact that the armed forces need more money than ever to win the war, while the average worker has more money than ever before to spend. Particularly so, on a *family income* basis—since in so many families several members are working, now.

Remember, the bond charts of today are the sales curves of tomorrow! Not only will these War Bonds implement our victory—they'll guard against inflation, and they'll furnish billions of dollars of purchasing power to help American business re-establish itself in the markets of peace.

So get this new family income plan working at once. Your local War Finance Committee will give you all the details of the new plan. Act today!

This advertisement prepared under the auspices of the War Advertising Council and the U. S. Treasury Department.

LET'S KEEP ON Backing the Attack!

This Space is a Contribution to America's All-Out War Effort by

EXCAVATING ENGINEER

this high production will have to be maintained to meet our needs," Colonel Harry A. Montgomery, executive officer, supply division, office of the Chief of Engineers, said at a War Department conference in Washington, D. C.

"On the tractor situation substantial expansion is planned. They are used for jungle fighting as well as construction work now. In the first quarter we hope to double our 1943 maximum quarterly output. New facilities to do this are now being brought into action.

"In the case of landing mats, shortages slowed our program during the first half of this year. The program is still enormous and we want a lot the first quarter. We're averaging now about $18,000,000 worth each quarter and next year we hope to average $20,000,000.

"A shortage of Engineer construction equipment, tractors, cranes, and freight handling equipment would be disastrous since without them supplies could not be moved into or handled by the Theaters of Operation," Colonel Montgomery said.

Allow Closer Oil Well Spacing in Michigan

Greater development of oil fields in 12 Southwestern Michigan counties will be possible as a result of an order allowing closer oil well spacing patterns issued by the Petroleum Administrator for War Harold L. Ickes. The Administrator said that the action was taken to provide additional production capacity close to the important refining, industrial, and consuming centers of the Middle West and because operators will find it easier to develop their oil properties since the producing formations in Southern Michigan are in most instances irregular.

Highlights of the Order, as outlined by Deputy Administrator Ralph K. Davies, are:

An oil well may be drilled on a ten-acre tract, provided the well does not exceed 1,400 feet in depth. Previously the Order established a 20-acre spacing pattern for wells of 2,000 feet or less.

If an oil well is drilled to a depth of 1,400 to 2,500 feet, a 20-acre spacing pattern will prevail.

The 40-acre spacing pattern (as defined in Petroleum Administrative Order No. 11) will apply to all wells drilled to depths greater than 2,500 feet. This provision will not affect present operations however, since no fields in the affected counties produce at those depths.

Now, a well may be drilled at a point 300 feet from the nearest unconsolidated properties. Previously, a 330-feet limit was required.

Trinidad Governor Visits Irrigation Developments

With the objective of gathering first-hand knowledge of the fundamental problems involved in the irrigation of arid and semi-arid lands as a basis for future irrigation developments in Trinidad, Sir Bede Clifford, Governor of Trinidad, made a three-week tour of Federal Reclamation projects in the West.

According to Harry W. Bashore, Commissioner of the Bureau of Reclamation, the Governor visited the Grand Coulee Dam and Columbia Basin Project (Washington); the Yakima Project (Washington); the Central Valley Project (California); Parker Dam (Arizona-California); and the Salt River Project (Arizona); and also a number of developments under the Office of Indian Affairs in Arizona and New Mexico.

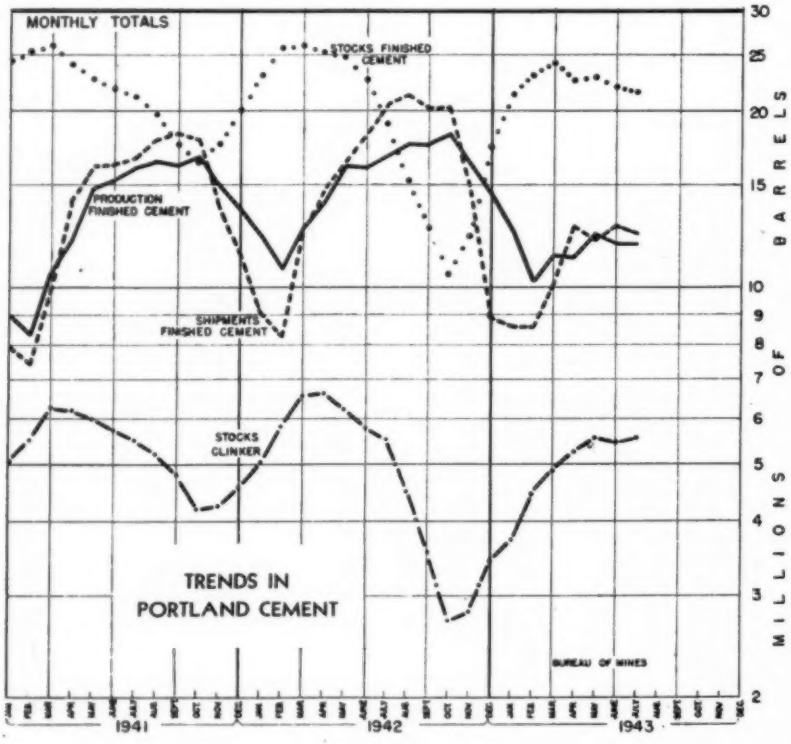
Engineers to Advise on Coal Utilization Problems

Solid Fuels Administrator Harold L. Ickes announced the appointment of 62 engineers to serve the Solid Fuels Administration without compensation for general consultation and field survey work solely in connection with engineering problems involving utilization of coal.

The engineers who have accepted appointment to assist the Administration remain free to continue their regular occupation. Their services will be available to industrial consumers who desire advice on combustion problems in their plants.

To facilitate contact with other Government agencies, J. E. Tobey, 122 E. 42nd St., has been designated as chief consultant in the New York area and Vernon G. Leach, 231 La Salle St., as chief consultant in the Chicago area. The list of consultants follows:

Joseph W. Lloyd, DeBardeleben Coal Corp., and Larry W. Milner, Brookside-Pratt Mining Co., Birmingham, Ala.; Chester A. Reed, National Coal Association, Washington, D. C.; Paul R. Hayes, Blue Diamond Coal Sales Co., Augusta, Ga.; Fred H. Bird, Binkley Coal Co.; Peter G. Hacquebart, Raleigh Smokeless Fuel Co.; Joseph Harrington, Northern Illinois Coal Corp.; Howard A. Herder, Sahara Coal Co.; Vernon G. Leach, Peabody Coal Co.; Roswell C. Rasmussen, Bell & Zoller Coal Co.;



• Output and shipments of finished Portland cement during July, as reported to the Bureau of Mines, United States Department of the Interior, were respectively 11,880,000 and 12,411,000 barrels. Although these totals showed little change from figures for the preceding month, output was 29 per cent and shipments 39 per cent below similar data for July 1942. Thus the long-term downtrend in industry-activity was continued through July at a more rapid rate than in several prior months. Total shipments during January-July 1943 declined from the same period of 1942 in greater proportion than production owing partly to the necessary repletion of stocks during January-March. Also, since March, shipments have remained at approximately the same level as production whereas in 1942, beginning in June, shipments greatly exceeded production and stocks were reduced. Since March 1943, stocks have been maintained near customary operating levels and at the end of July were 13 per cent above those on July 31, 1942.

Never before in any war...
motorized equipment that pulls itself up by bootstraps *of modern*

Preformed wire rope

Dragging a heavy field piece through trackless wilderness, the sturdiest "cat" may bog down and stall in deep and slippery mud.

In this emergency the line of Preformed Wire Rope on the front winch is securely anchored to a rock or tree up ahead. Then, with a strong and steady pull, the "cat" inches its way out of trouble and resumes its journey.

Preformed Wire Rope handles these patient, ponderous jobs as well as the hair-trigger reactions of airplane controls—as easily as the thousands of everyday jobs. Preformed Wire Rope wears longer, speeds work, reduces accidents, slashes costs. If you haven't tried Preformed Wire Rope—

Ask your own wire rope manufacturer or supplier

Lynn S. Spring, Koppers Coal Div.; Robert L. Sutherland, Truax-Traer Coal Co.; Albert E. Vatter, Walter Bledsoe & Co.; Shepard H. Viall, Chicago, Wilmington & Franklin Coal Co., all of Chicago, Ill.; Lowell Malan, United Electric Coal Companies, Mine No. 11, DuQuoin, Ill.; Stephen J. Bond, Enos Coal Mining Co.; Max A. Tuttle, Knox Consolidated Coal Co.; William A. Williams, Island Creek Coal Sales Co., all of Indianapolis, Indiana; Don W. Machin, Pittsburgh & Midway Coal Mining Co., Lawrence, Kansas; Eugene D. Benton, Louisville & Nashville R. R. Co.; Vaughn Mansfield, Southern Coal Co.; Thomas J. Tarzy, Southern Coal Co., Inc., all of Louisville, Ky.; John R. Etlar, Fidelity Engineering Co.; Wilbur D. Lawson, Consolidation Coal Co., all of Baltimore, Md.; Felix E. Rapetto, Pocahontas Fuel Co., Boston, Mass.; Granville W. Anderson, Koppers Coal Division; Thomas P. Bateman, Consolidation Coal Co.; Harry N. Holloway, Island Creek Coal Sales Co.; Alfred D. Muldoon, Chesapeake & Ohio Rwy. Frank O. Runnels, Island Creek Coal Sales Co., all of Detroit, Mich.; Joseph A. Morgan, Pittsburgh Coal Co., Minneapolis, Minn.; Norman Burnside, D. L. & W. Coal Co.; Wilbur W. Criswell, Jr., United Eastern Coal Sales Corp.; Edmund McCarthy, Upper Monongahela Valley Assoc.; Earl C. Payne, Consolidation Coal Co.; Julian E. Tobey, Upper Monongahela Valley Assoc., all of New York, N. Y.; Paul B. Barkman, Cleveland Cliffs Iron Co., Cleveland, Ohio; Homer M. Faust, New York Coal Co.; Frank R. Stilwell, Red Jacket Coal Co., of Columbus, Ohio; Carroll F. Hardy, Appalachian Coal, Inc.; Otto J. Menke, Island Creek Coal Sales Co.; William Mittendorf, Holmes-Darst Coal Co., all of Cincinnati, Ohio; Joseph D. Doherty, Koppers Coal Div., Pittsburgh, Pa.; Lester C. Bosler, Coleman & Co.; Ernest E. Finn, Anthracite Industries, Inc., Fred J. Kasper, Koppers Coal Div.; Joseph H. Kerrick, Philadelphia & Reading Coal & Iron Co., all of Philadelphia, Pa.; Lawrence A. Shipman, Southern Coal & Coke Co., Knoxville, Tenn.; Roy J. Buchanan, Koppers Coal Division, Norfolk, Va.; Thomas H. Duffy, Chesapeake & Ohio Rwy., Richmond, Va.; Frank L. Donaher, Norfolk & Western Rwy.; George O. Ellstrom, Norfolk & Western Rwy.; James G. Giltner, Norfolk & Western Rwy.; Daniel J. Howe, Norfolk & Western Rwy; George A. Morris, Norfolk & Western Rwy.; Fred K. Prosser, Norfolk & Western Rwy.; Lyndon J. Whitlock, Jr., Norfolk & Western Rwy.; David H. Williams, Norfolk & Western Rwy., all of Roanoke, Va.; Minott Brooke, Chesapeake & Ohio Rwy., Huntington, W. Va.; Eugene J. Kerr, Island Creek Coal Co., Huntington, W. Va.; John Scott, New River Co., Mt. Hope, W. Va.; Karl W. Karlson, Republic Coal & Coke Co., Racine, Wis.

Fabricated Structural Steel Bookings Cut in Half

The bookings of fabricated structural steel (buildings, bridges and sundry war product items) for the month of August, 1943, according to reports received by the American Institute of Steel Construction, Inc. amounted to 43,951 tons, as compared with 80,605 tons for the corresponding month last year.

Shipments showed a further decline to 51,511 tons from 61,922 tons for the previous month. The tonnage available for future fabrication at August 31st was 281,537 tons.

Resume Construction of Newton Irrigation Project

The Bureau of Reclamation has been authorized by the President to resume construction of the Newton Irrigation project in Cache County, Utah, halted by the War Production Board in December, 1942, to divert critical materials to other war activities, Secretary of the Interior Harold L. Ickes announced.

On the basis of a report by Commissioner of Reclamation Harry W. Bashore, the Secretary said that the work involves the completion of an earth and rock fill dam to replace an old dam, built by private interests, which has deteriorated to such an extent that State officials have restricted the storage of water behind it. The project will pro-

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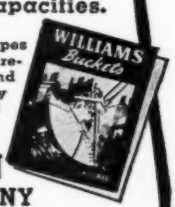
WELDED ROLLED STEEL CONSTRUCTION

eliminates cumbersome dead weight and insures a stronger bucket that will wear longer with less breakage and less cost for maintenance.

This welded design which has made Williams Buckets so universally used in steel mill service is now featured in all Williams Clamshell and Dragline Buckets. 3/8 to 16½ yd. capacities.

Send for free bulletin covering types of buckets for your particular requirements. It shows details of design and many exclusive features that clearly prove why YOUR NEXT BUCKET SHOULD BE A WILLIAMS.



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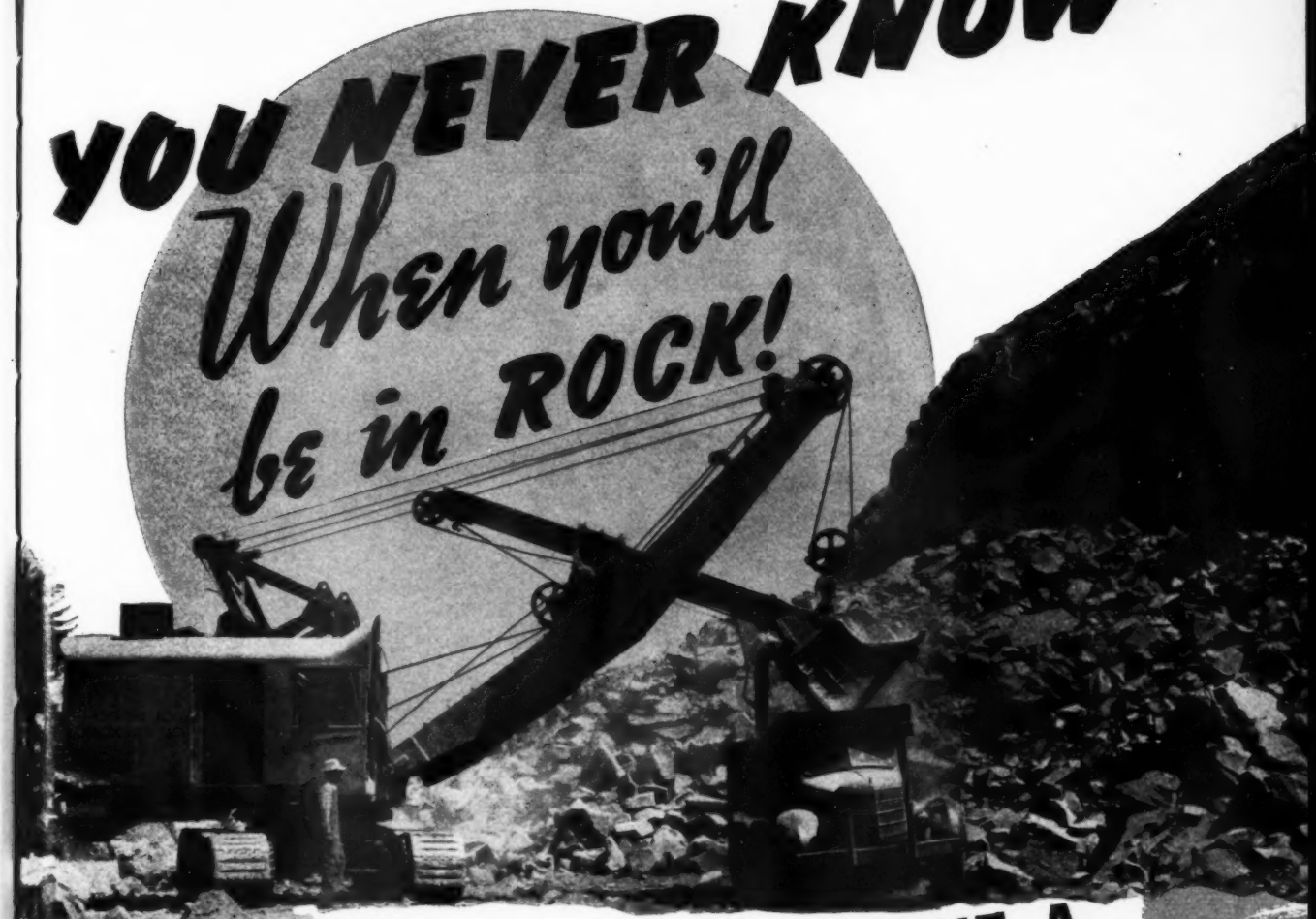
When you'll be in ROCK!



—IF YOU HAVE A REAL ROCK SHOVEL, YOU'LL NEVER HAVE TO WORRY ABOUT ANY KIND OF DIGGING ON THOSE POSTWAR CONTRACTS

After VICTORY Buy NORTHWEST

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vide a full supply of water for 565 acres of productive land and a supplemental supply for 1,660 acres now in cultivation but not intensively farmed because of a shortage of water in the late summer.

Importance of Highways

Impressive evidence of the war importance of highways is given in the Federal Works Agency report which shows that, of 749 Michigan corporations manufacturing war materials, 70 per cent receive 50 per cent or more of their incoming materials by truck and 38 per cent receive 90 per cent to 100 per cent. Further, 76 per cent ship 50 per cent or more of their products by truck and 43 per cent ship 90 per cent to 100 per cent. And 73 per cent of the workers reach their plants by automobile.

Construction Contracts 43 Per Cent Below August, 1942

Construction contracts awarded during August totaled $413,791,000 in the 37 eastern states, according to F. W. Dodge Corporation. This compared with $183,661,000 in the preceding month, but, was 43 per cent behind the $721,028,000 recorded in August last year. Valuation of public ownership projects in August was 45 per cent below the same month last year while private ownership was off only 29 per cent.

Non-residential building volume of $272,888,000 in August was largely effected by non-recurring war construction and compares with $61,840,000 in July and $407,324,000 in August a year ago.

The August total of $67,493,000 for residential building represented a decline of six per cent from the preceding month and a decline of about one-third from August, 1942. Eliminating barracks and temporary-type dormitories for single men, however, August was only two per cent behind last year and the number of new dwelling units created exceeded those of August a year ago by two per cent.

Heavy engineering work, valued at $73,410,000, represented an increase of 47 per cent over July, but was 64 per cent below August last year.

• **Workmen fill in construction sand in steel grating mat panels of the first installation of a steel roadway strip in Darien, Conn., to test practicability for post-war construction. After filling the interstices with sand, a coat of road oil is applied. The steel roadway project is a joint venture of Darien and the Irving Subway Grating Co. of Long Island City, N. Y., originators of the steel highway.**

Standardize Vitrified Clay Sewer Pipe

Simplification and standardization of vitrified clay sewer pipe and fittings, announced by the War Production Board, will reduce the number of sizes from 21 to 13 and of specifications from five to two. This action is taken by Limitation Order L-316, which is expected to result in a saving of 2,308,775 manhours per year and in considerable conservation of materials. The order became effective October 25, 1943.

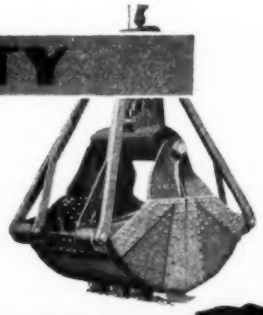
Under the provisions of the order, the country is divided into three zones: Zone 1: all territory within continental United States not included in Zones 2 and 3; Zone 2: California south of the 36th parallel; Zone 3: California north of the 36th parallel and the State of Washington.

Zones have been established, the Building Materials Division explained, because somewhat different standardization practices have already been established by the 10 per cent of the industry located in Zones 2 and 3 (the States of California and Washington) and this standardization fulfils the general conservation objectives of the order. Products manufactured in each of these zones are usually sold only within the limits of that zone. Hence, Division officials stated, it is more practicable to

STAUNCH DEPENDABILITY

Through demonstrated dependability servicemen have come to place implicit confidence in the ever faithful and efficient American Red Cross.

Through long demonstrated performance, too, bucket users have come to depend with confidence upon Owen Buckets as the most rugged and dependable units available to meet their various important requirements.



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OWEN BUCKETS
"MOUTHFULS" FOR EVERY JOB

• A bullgrader equipped tractor pulls a train of three sand sleds on the beach somewhere in the South Pacific during recent maneuvers of a Marine Corps engineering regiment. The sleds slide along just as easily as though they were on snow—saving those precious rubber tires for planes, jeeps and other mechanized equipment.—Official U. S. Marine Corps Photo.

allow the standardization practices already in effect there to remain unchanged rather than to bring them in line with the practices imposed for the remaining 90 per cent of the industry.

L-316 will affect the 79 plants comprising the industry. The estimated saving of over two million man-hours will result from a great reduction in the number of die changes, the simplification and standardization of fittings, and the continuous operation of presses and full use of kilns.

Construction Declines

Monthly production reports issued by Donald M. Nelson, chairman of the War Production Board, reveal that construction again declined according to plan. One of the most advanced programs, construction is now 76 per cent done and 24 per cent to go. A chart of construction shows that most of the year's building of bases and industrial facilities was concentrated in the early months, thus permitting a tapering off of work. The decline from July amounted to three per

Brazil Organizes National Highway System

Faced with need for better internal communications to aid development of economic resources, Brazil has taken steps to organize an integrated national highway system.

By decree of President Vargas, a commission is being formed to prepare the national program, consisting of representatives of the National Highway Department, War Department, Department of Ports and Navigation, National Railroad Department, Reclamation, Bureau and Committee for the Study of State Affairs.

Brazil has need for additional roads into the interior and into the Amazon Basin, where develoment of rubber, minerals and other strategic resources is under way to supply United Nations war industry and Brazil's own growing needs for raw materials.

Coal, Coke Production in Canada Drops

Coal production in Canada in the first five months of 1943, officially reported at 7,448,523 tons, shows a 6.9 per cent drop from the 8,003,260 tons produced in the comparable period of 1942.

Coke output dropped 4.5 per cent to 1,302,810 short tons for the first five months of 1943, compared with 1,363,835 tons in the first five months of 1942.

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BRAKE BLOCKS
and LINERS
Custom-Bilt
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Heavy Duty Equipment.

Smooth, non-grabbing action that adds miles to tire life.
Balanced holding power for positive stopping under all conditions.
No letdown in efficiency on steep grades or under prolonged use.
Long wear life with fewer adjustments to keep 'em on the road.
Prolonged drum life to save maintenance time and cost.

These are some of the reasons why GATKE *CUSTOM-BILT* Brake Blocks and Liners make a world of difference in meeting today's tough maintenance requirements.

Ask your GATKE Jobber or write for details.

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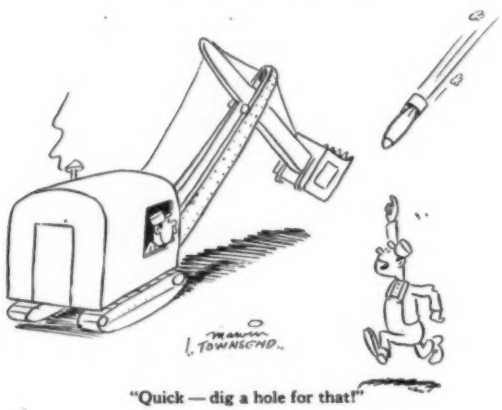
BRAKE BLOCK DIVISION

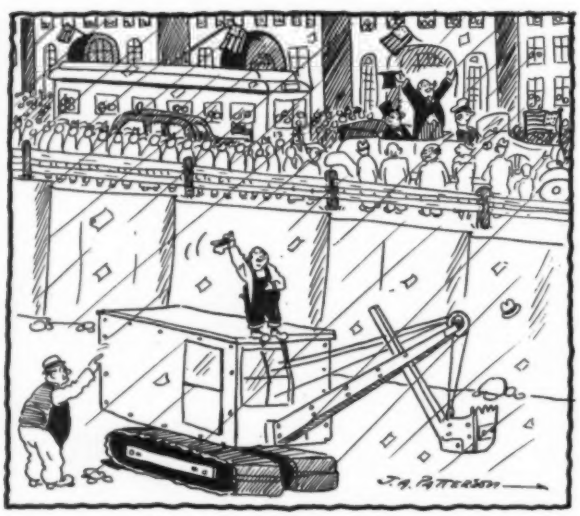
"Jones is a good man but we have to keep reminding him!"

"He brushes his teeth twice a day!"

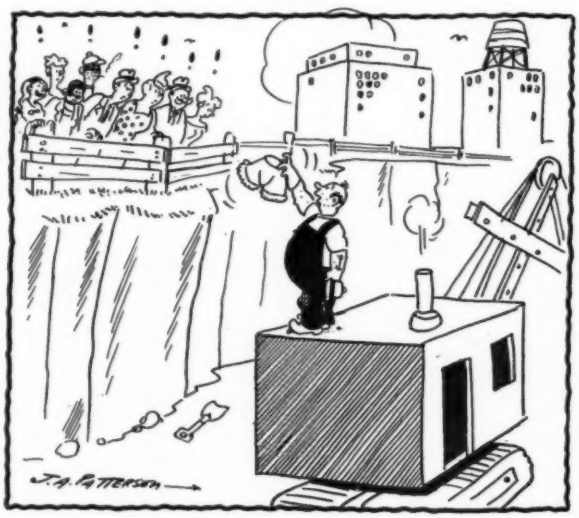


"Quick — dig a hole for that!"

"If Joe doesn't give up smoking I'm afraid it's going to injure his health!"



"Get down from there you dummy — that's not for you!"



"Did anybody in the audience lose these?"

9 Factors Affecting the Life of Wire Rope (Continued)

{This is number 18 in a series of articles prepared by Macwhyte Wire Rope Company for the benefit of wire rope users everywhere. All articles in this series are yours for the asking. Macwhyte Engineering Experience is available on specific problems.}

★ ★ ★

In the previous article of this series, the first four of nine factors affecting wire rope life or service were discussed. They were:

1. Abrasion or Wear *3. Tension or Stress*
2. Bending or Flexing *4. Speed*

As the article pointed out, these four can be kept from doing too much harm (to rope and machine) by frequent checkups.

While some of the four factors mentioned above are normal and to be expected, there are five other "rope saboteurs" which are *not* normal. These can be corrected. They are:

5. Crushing or Mashing *7. Jerking or Shock*
6. Weathering or Corrosion *8. Vibration*
9. Heat or Friction

What can you do to correct them, and thus save steel and time now so urgently needed? Here are specific suggestions.

Crushing or Mashing

Improper winding (criss-crossing) on the sheaves or drums results in crushing or mashing. It *pays* to start the rope winding properly. Keep it from criss-crossing and reduce scuffing against the flanges of the drum and against the under layer to a minimum.

Where rope is loose on the ground (on incline slopes especially) it pays to prevent trucks or equipment from running over the rope. Lubricate rollers, sheaves, and guides so as to avoid undue abrasion. When rope jumps a sheave, stop and replace it before continuing the operation.

Permanent injury to the rope and damage to equipment can result if a rope is operated while out of its proper sheaves. In clamping or fastening the end of the rope use care to avoid needless damage.

Weathering or Corrosion

Wire rope is made of high carbon steel wire and will rust and corrode if not properly protected by a suitable lubricant, especially if it is not in constant use. Proper lubrication keeps the rope flexible and reduces wear as well as affording a protection against corrosion. (See article 10 in this series.)

Jerking or Shock

If there is slack in a rope, take it up slowly before the load is applied. This is where the human element enters the picture. Many a rope is ruined for lack of care on the part of the operator. A quick pickup with as little as 12 inches of slack will more than double the load on the rope and may cause it to snap. Even if the rope doesn't break immediately, it is weakened and breaks later in normal operation. (See article 15.)

Vibration

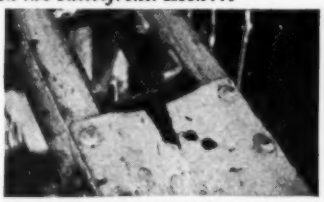
Vibration of wire rope in service fatigues the steel wires and consequently "tires" them out before they wear out. It is difficult to correct this except where this vibration is caused by faulty equipment and hurried handling. A clutch or brake may chatter and this vibration is multiplied many times throughout the length of the rope. Vibration may cause rope to break where it is dead ended (fastened). Where wire rope is fastened in a socket, continuous vibration will cause the wires to break right at the socket—cutting off a short section and refastening is a cure for this. A smooth pickup and steady operation will do much to eliminate vibration.

Heat or Friction

Heat changes the structure of steel. In general, it hardens it or makes it more brittle. Friction creates heat. Lubrication helps reduce friction. A stuck roller, a poorly aligned sheave, scuffing against wraps of rope on a drum, scraping on rock or metal creates friction and heat. Wire rope must be kept free to do its job of bending. Heat and friction will change its steel composition and cause it to break up prematurely. Where ropes travel at high speed, watch out for the effects of heat.

Not EVERY Enemy is found on the battlefront. Look . . .

Killed through Carelessness. Literally chewed to death, this rope was ruined before showing any normal wear.



Unnecessary Abrasion. A hoist rope was allowed to saw through a heavy plate. Such waste can and should be avoided.

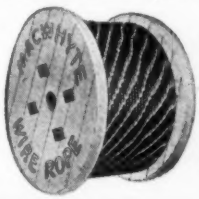
Mashed to Death. Criss-crossed on the drum, this rope gave only a fraction of the service it might have, had more care been used in spooling.

Why Such Waste? This rope has been cutting a number of grooves in the bucket rim. It will give poor service and increase operating costs.

Your Wire Rope Requirements

The benefit of years of experience based upon servicing equipment similar to yours is gladly given. When you ask Macwhyte for suggestions and recommendations, you can be assured not only of getting "The Correct Rope for Your Equipment," but also a personal interest in helping *you* get the most out of *your* rope.

Feel free to consult with Macwhyte distributors, Mill Depots representatives, or write to Macwhyte Company direct.



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... Macwhyte's best grade wire rope, famous for its strength, toughness, preforming, and internal lubrication.

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MONARCH WHYTE STRAND Wire Rope
MACWHYTE Special Traction Elevator Rope
MACWHYTE Braided Wire Rope Slings
MACWHYTE Aircraft Cables and Tie-Rods

OBITUARIES

(Continued from page 548)

a new labor policy. He put one man, a "captain", in charge of a rig and gave him one-half interest in the net returns from its operation. The "captain" hired his crew, bought his own supplies and ran the job in general. In the fall of 1927 he combined his many of these units into the John Phillips Company which he headed.

Mr. Phillips was selected to serve on the advisory board of the Industrial Indemnity Exchange, an inter-insurance organization of leading contractors. In 1934, when his own company was well organized and functioning smoothly, he accepted the position of chairman of the advisory committee of the Exchange. Under his chairmanship the organization prospered with premium volume climbing from around one million dollars in 1934 to around eight millions in 1942.

Ira Clemens

Death brought to a close the career of Ira Clemens of Pittsburg, Kansas, who was prominent in the development of the coal business in Kansas and whose activity in this business extended over a period of 59 years until his retirement caused by ill health in 1941. He was 69 when he died.

Mr. Clemens was born in Ray County, Missouri, on October 27, 1873. He came to Kansas with his parents and started working in the mines around Weir City when he was nine years old, a common practice in those days. His first job in the coal mines was wheeling ashes from the mine engine room at ten cents a day. He later worked in the engine room wheeling in coal for 35 cents a day, and then went to work in the underground mines at 50 cents a day.

Later Mr. Clemens worked with his father, the late John H. Clemens, a pioneer in Kansas coal mining. He worked in various capacities with his father except for the period of 1894 to 1897 when he was employed as a brakeman for the Frisco Railway company.

The first Clemens coal company was that of Clemens & Son. Later the Clemens Coal Company was organized and headed by Ira Clemens. Mr. Clemens sold his interest in this company in 1930 and devoted his attention to the Commercial Fuel Company which he organized. He continued with this latter firm until his retirement on May 1, 1941. Even though Mr. Clemens relinquished the reins as general manager of the Commercial Fuel Company, his son, John I. Clemens, continued in the position of vice-president of the concern.

Mr. Ira Clemens was one of the best known coal operators in the whole country for many years and up to the time of his retirement he had participated in every wage conference since 1903. During World War I he was production manager for the coal industry in seven states under the direction of Harry A. Garfield, fuel administrator. He took part in national conferences of all sorts involving the coal industry.

For five years, in divided periods, Mr. Clemens was president of the Southwestern Coal Operators Association. He was an original director of the National Coal Association and helped to organize the Associated Industries of Kansas and served as charter president. Although a foremost representative of coal operators, Mr. Clemens had long been a close friend of John L. Lewis, president of the United Mine Workers of America.

Although he was forced to leave school at an early age, Mr. Clemens was awarded an honorary doctor of laws degree by Creighton university in Omaha in 1940 in recognition of his work in the interest of education. Over a period of about 17 years he had financially helped nearly 100 boys and girls to obtain an education.

Mr. Clemens was married to Miss Julia Ryan of Cherokee county in January, 1898. In addition to his widow, Mr. Clemens is survived by two daughters: Mrs. W. Hawley Seymour of Pittsburg, Kansas, and Mrs. William B. Coles of Joplin, Missouri; two sons, John I. of Pittsburg and William L. Clemens of Los Angeles; his mother, Mrs. Julia A. Clemens of Weir, Kansas, and three brothers, Harrison of Pittsburg, William of Minden, Missouri, and Charles Clemens of Los Angeles.

Big Savings

The above picture of a small Sauerman Scraper digging gravel from pit and delivering to crushing plant shows the simple effectiveness of this method. This Sauerman machine uses 4½ gals. of gasoline per hour to move 45 cu. yd. of material.

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The Sauerman Catalog pictures and describes many typical projects where materials are being dug, hauled and placed at costs of a few cents per ton. A copy of this useful book is yours for the asking.

If you move materials the SAUERMAN way...

Where materials are to be moved distances of several hundred feet or more, a SAUERMAN Drag Scraper or Cableway can cut the cost per cubic yard to a low figure because it is able to dig, haul and place the material in a continuous, straightline operation, doing away with the expense of rehandling. The operation is smooth and rapid, producing large yardage with moderate expenditure of power.

The first cost of a SAUERMAN Machine is reasonable, maintenance amounts to very little, and the simplicity of operation makes it possible to place the control of even the largest installation in the hands of one operator. Moreover, the machine is very flexible, hence it is easy to adapt it to the exact needs of different jobs.

SAUERMAN BROS., Inc.
574 S. Clinton St., Chicago 7, Ill.

Beating Schedule

(Continued from page 541)

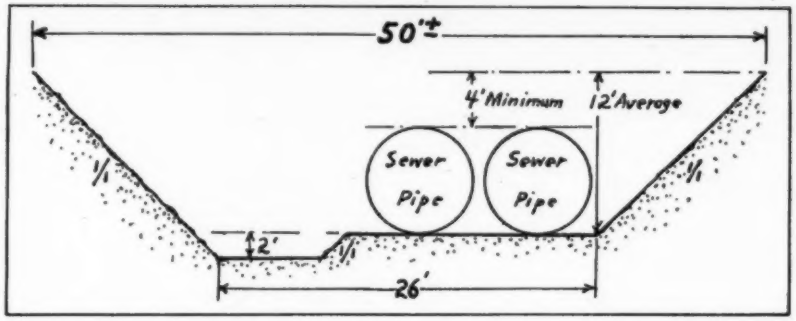
turn, subcontracted a portion of the borrow excavation work to the Deppe-Raemisch Co., composed of the W. W. Deppe Co. of Baraboo, Wis., and the F. H. Raemisch Co. of Waunakee, Wis. Much of the hauling and some of the other peat and borrow excavation work was handled by the Crystal Lake Trucking and Excavating Company of Crystal Lake, Illinois. A basis of 20,000 cu. yds. of excavation a day, set at the beginning, was exceeded on the job.

General Grading Operations

During the ditching operations, general grading operations got under way in the drier areas on April 14. Six LeTourneau Tournapulls of 15-yd. (heaped) capacity and 14 LeTourneau scraper and one Heil scraper ranging in capacity from 15 to 23 yards (heaped), powered with D-8 Caterpillar tractors and Caterpillar D-8 push tractors were used for the general grading. Eight Caterpillar tandem wheel patrols were used for finishing. Tournapulls were used exclusively for all top dressing work after paving because the Army allowed only rubber-tired equipment to travel on the finished pavement of the airport runways.

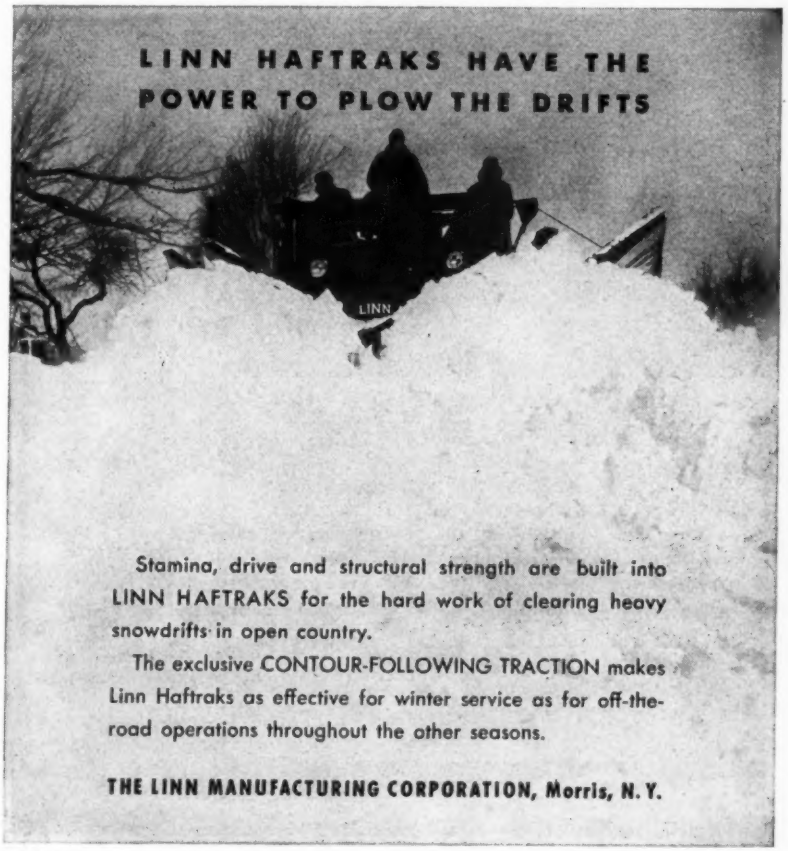
The tractors and scrapers were used for all hauls under 2,000 feet and the Tournapulls were used for longer hauls up to 1½ miles. The scrapers averaged from 7,500 to 10,000 cu. yds. per 12-hr. day and the Tournapulls, with longer hauls, averaged approximately 700 cu. yds. in the same period. Shovels, draglines and trucks were used on hauls from one to three miles and peak haulage with the trucks amounted to 7,500 cu. yds. while they were being worked in two daily eight-hour shifts. The need for borrow during peak operations necessitated two eight-hour shifts.

The M. J. Boyle Co. faced one of its most serious problems at the beginning of the job in getting enough material, sand, gravel and cement, for extensive paving of aprons, taxiways and runways. Although there are several small commercial firms operating in the area, other construction being done at Patterson Field, and nearby Wright Field, overtaxed the production of all commercial plants within an economical truck haul radius of Patterson Field. At the outset of the job, the M. J. Boyle Co. considered transporting material by rail from a quarry about 50 miles away and building a batching plant on a spur railroad line about a mile east of the construction area. But, due to the tremendous quantity of material necessary, a maximum of 7,500 tons of combined sand and gravel per day, the uncertainty of transportation equipment, and in order to insure performance and completion of the work in the allotted time, it was decided to construct a washing plant and use materials from the river-bottom land adjacent to the airfield on the west.



• Diagram illustrating method used to lay concrete sewer pipe in the dry. A lateral drainage ditch is constructed in the same trench two feet below the flow line of pipe and connected to a sump at the outfall structure.

Tests were made by the Central States Construction Co. of Crosby, Minnesota, subcontractors, of the available material and a site was selected for the erection of the plant immediately adjacent to the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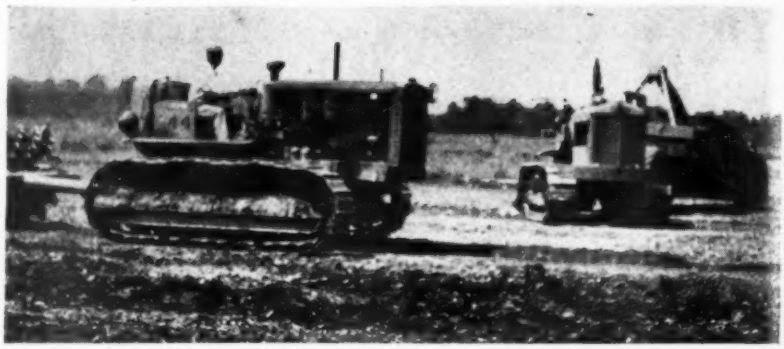
The exclusive CONTOUR-FOLLOWING TRACTION makes Linn Haftraks as effective for winter service as for off-the-road operations throughout the other seasons.
THE LINN MANUFACTURING CORPORATION, Morris, N. Y.

airfield area where material was found to meet Army Engineer specifications. A semi-permanent plant was erected by Central States with a rated capacity of 250 tons of combined aggregate per hour and with a peak capacity of 400 tons per hour under favorable conditions.

Batching Plant

The batching plant proper, constructed by the M. J. Boyle Co., consisted of two Blaw-Knox sand bins and two Blaw-Knox stone bins each of 105-ton capacity and four cement bins, three Blaw-Knox of 300-barrel capacity and one Butler of 450-barrel capacity.

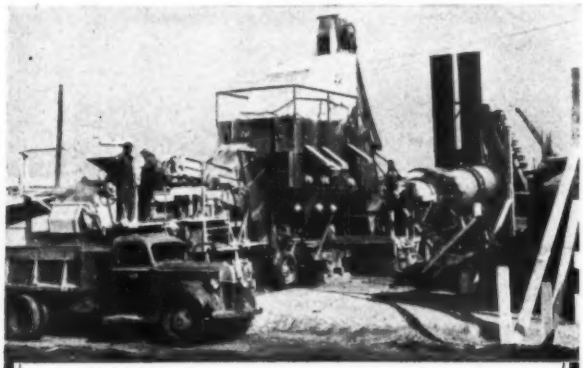
A 2-yard Northwest dragline was used in the aggregate pit to load trucks which hauled the aggregate up ramps to a rail-grading hopper. The aggregate passed through the rail-grading hopper over a 24-inch rubber conveyor belt up to a vibratory screen where it was graded and washed. Oversize was diverted to a crusher and conveyed up to the vibratory screen. The coarse aggregate was conveyed on a 75-foot belt and discharged from 20 feet above ground to a stock pile. Sand was stock-piled on the opposite side of the washing plant in a similar manner. Primary stock-piles were on 135-foot centers. The maximum size coarse aggregate used was 1½".



• Caterpillar tractors hauling a 15-yd. Heil scraper and a sheepsfoot roller in the grading operations.

From the primary stock pile the material was re-handled with two clamshells, a Koehring 604 1½-yard on the gravel and a Bucyrus-Erie 37-B 1½-yard, on sand to secondary stock-piles where materials were allowed to drain a minimum of 24 hours. From these secondary piles a Marion 1¾-yard clamshell was used to load the coarse aggregate to one hopper and a Northwest 1½-yard clamshell was used to load the coarse aggregate to the other gravel hopper. Two Bucyrus-Erie clamshells, one a Bucyrus-Erie 1¼-yard and the other a Bucyrus-Erie ¾-yard, were used to load sand from the secondary stock-piles to the sand hoppers.

The stock-pile of gravel ranged



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The Barber-Greene booklet, "Versatility", completely describes the various setups of the mixer. It can be obtained from your Barber-Greene representative without obligation.

Q-31

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HAVE YOU SEEN THE NEW
BUCYRUS ERIE 22-T BLAST HOLE DRILL
These low-cost, modern 22-T's offer small or medium-sized quarries, cement plants, and contractors the same unexcelled performance that has made Bucyrus-Erie blast hole drills such popular machines in large quarries and mines all over the world. Designed to drill 6-in. or 6-⅝-in. holes to depths of 100 feet and over with utmost economy, this new Bucyrus-Erie 22-T gives you the shattering blows, high drilling speed, complete mobility, exceptional cable economy, and other cost-saving advantages of the larger modern blast-hole drills.
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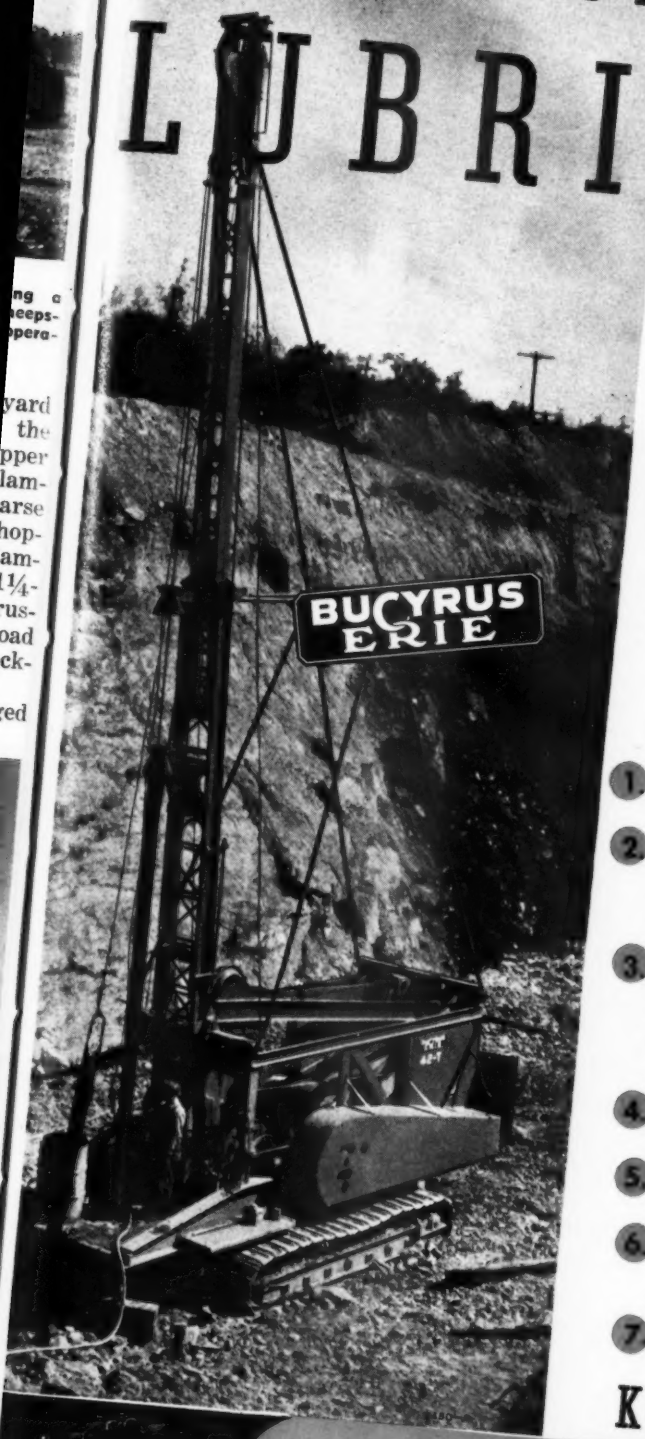
Your Blast Hole Drill Needs LUBRICATION



to last the duration!

You can do much to help your blast-hole drill endure the war years — while it's working its hardest and best — by lubricating it regularly. Be sure to follow carefully the complete lubrication instructions of your drill manufacturer, and you'll be well on your way to drilling as Uncle Sam likes it — at top speed for the duration.

Here Are Some Points to Watch:

1. Bearings on crown sheave and sand line sheave should be lubricated once each shift.
2. On modern machines lubricate ball or roller bearings on jackshaft and engine pulley shaft with small amounts about once each week. Don't use graphite grease. On older machines with plain bearings, lubricate daily.
3. If your machine is caterpillar-mounted, lubricate crawler fittings once each week, oftener when machine is propelling long distances. Even when your drill is not travelling, keep cats lubricated against wearing motion developed in drilling.
4. Keep wire lines lubricated with wire rope lubricant to prolong their life.
5. Be sure to lubricate spudding pinion and bull reel pinion once each shift.
6. Don't overlook sand reel shaft bearings and operating lever connections — they should be lubricated once each shift.
7. Get complete lubrication instructions from your drill manufacturer and follow them carefully.

Keep 'em Drilling

H-46

ARMY E NAVY

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

in amount from 25,000 to 35,000 tons and the stock-pile of sand ranged in quantity from 15,000 to 25,000 tons. Working hours were adjusted to maintain the necessary stockpiles. During the peak of operations the machines were kept working 14 hours a day, seven days a week. The day's record at the batch plant was 2,258 batches of 1.4 cu. yds. each, involving 2½-tons of combined sand and gravel per batch. In its original state the sand and gravel used contained less than five per cent silt. Material used for the sand and gravel sub-base for pavement was taken from the borrow pit and mixed with from 10 to 15 per cent clay. This mixture was spread by trucks, levelled by bulldozers and patrol graders, and compacted by using sheepsfoot and 10-ton tandem wheel rollers. Tests made of the pavement base and stabilized areas of the field after compaction showed that no difficulties were encountered in obtaining the required compaction by employing the Proctor Method,

• (Left to right) John Poynton, field engineer in charge of coordination; C. L. Sogge, general superintendent, and John Kelly, supervisor and purchasing agent.

using this material when properly moistened to meet specification requirements.

Bulk cement for the batch plant was hauled by six trucks of from 90 to 100 barrel capacity from two cement mills within a three-mile radius of the batch plant. The cement was dumped in the hoppers alongside of the cement silos and conveyed to the bins in vertical bucket-type conveyors. Cement bulk trucks were operated from 12 to 14 hours a day for six days a week during concrete-pouring operations at the field.

First Paving on Apron

The first paving done by the M. J. Boyle Co. at Patterson Field was the apron built in front of existing hangars. Preparations for this paving were started as soon as the drainage system was completed in this area. The sub-base was compacted over the entire apron area using sheepsfoot rollers followed by blading and then by a steel-wheel 10-ton tandem roller. Sand and gravel for the sub-base was hauled from the borrow pit.

Paving equipment used by the M. J. Boyle Company in paving the aprons, taxiways and runways included: four Ransome 34-E dual drum pavers and one Ransome 27-E single drum paver; three Jaeger transverse finishers; one Blaw-Knox transverse finish-

Stripped for Action . . . In New Guinea

This Osgood "20" . . .

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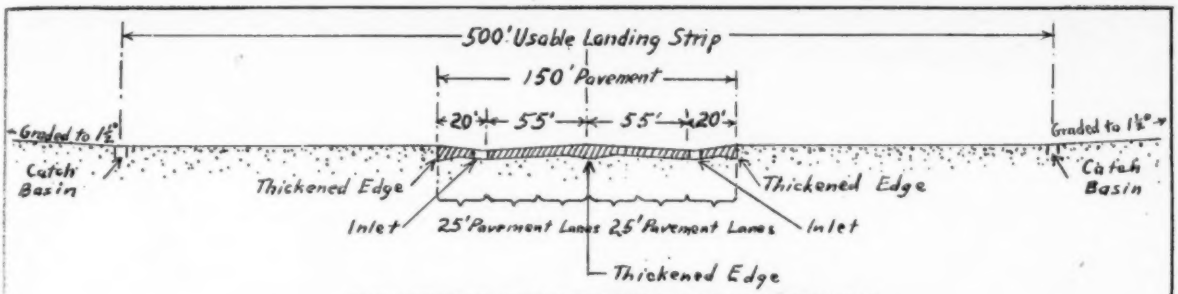

RUNWAY CONSTRUCTION METHOD
(EXAGGERATION—)

er; two Koehring longitudinal finishers; one Model 357 R-B finegrader; two Cleveland trailgraders; two Cleveland formgraders; two D-4 Caterpillar highlifts; seven water trucks varying in tank capacity from 1,200 to 2,000 gallons, each equipped with pumps and 24,000 feet of military type steel road forms.

The hauling was sublet to Fredericks & Phillips of Oshkosh, Wis., specialists in this line of work. This company used 45 two-batch dump trucks of various manufacture for the work.

The section of concrete pavement in the apron called for a 10-inch slab thickened every 100 feet laterally to 15 inches at the longitudinal expansion joints. Standard military-type, ¼-inch, steel road forms, were used along the 10-inch edge. The thickened 15" edge was formed by using 6" x 8" hardwood timber as plates with a standard military-type 9" form set on top. The timbers used were of a standard length and were drilled to accommodate the pin spacing in the forms. All pavement was laid in 25-foot lanes, necessitating heavy duty type forms capable of withstanding the vibration of the heavy grading and finishing machines the contractors used.

The R-B finegrader machine was used in all lanes of uniform thickness. Finegrading in the thickened edge lanes was accomplished by using a tandem wheel motor patrol followed by trailgraders set to the desired section. Trailgraders were drawn by Caterpillar D-6 tractors equipped with a highlift, which were also used to handle the surplus material accumulating before the trailgraders. Five-ton steel rollers were used for dressing the subbase in back of both the R-B machine and the trailgraders.

After the first apron paving was completed, the taxiways were constructed. With one exception, all taxiways were 50 feet wide, 10 inches deep, with 15 inches thickened edges. One section was built 75 feet wide.

Use W-type Design

The pavement on all runways was of W-type design. They were built 150 feet wide with a drainage line on each side 55 feet from the center line. Inlets were constructed on approximately 300-foot centers. The bottom section of these inlets consisted of a concrete box poured independently of the pavement at the time the sewers were constructed. The top section, dowelled integrally to the pavement, was separated from the lower section with a slip-joint collar to allow for movement. One hundred and seventy-five feet of stabilized soil on each side of the paved runways gave a usable landing strip 500 feet wide. (See drawing, top of page). In order to provide the drainage valley in outside lanes, the transverse finishing machines were set to the desired section. Koehring bullfloats used were set to be adaptable either

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Action shot of Brooks LOAD LUGGER

Material can be dumped or spread as desired. Only 15 seconds for loading or dumping the bucket.

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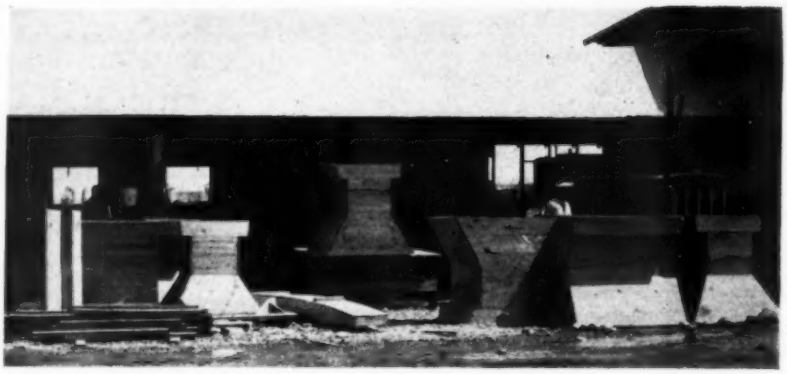
for the "V" section or for flat grade. The same method of construction was used on all three runways built at Patterson Field by the M. J. Boyle Co.

The paving gang consisted of two Ransome 34-E dual drum pavers operating in tandem, followed by a Jaeger finishing machine. Behind the finishing machine, a Flexplane machine set the dummy ribbon contraction joints. The Flexplane was followed by Koehring mechanical longitudinal floats (bullfloats). Hand finishers with straight edges and hand floats were then used and the pavement was finally finished by belting with burlap. After the initial set of the concrete, membrane curing compound was used, spread over the pavement with a power spray operated on tracks on a bridge that spanned the section of the pavement to which the curing compound was being applied.



• Manhole and inlet forms are constructed on the site in the M. J. Boyle Co.'s carpenter shop.

The record day's paving was 11,283 sq. yds. in a 10-hour day. There was a total of 85,000 batches, of 1.4 cu. yds. each, of concrete poured, or 414,000 sq. yds.

The fine quality of the concrete obtained on this job can be attributed to three factors: the efficiency of the washing plant where all materials were washed and rewashed; the excellent quality of material (sharp sand and good gradation of aggregate), and the control of the proportioning of the mix which was adjusted daily by the inspectors to compensate for the varying moisture content.

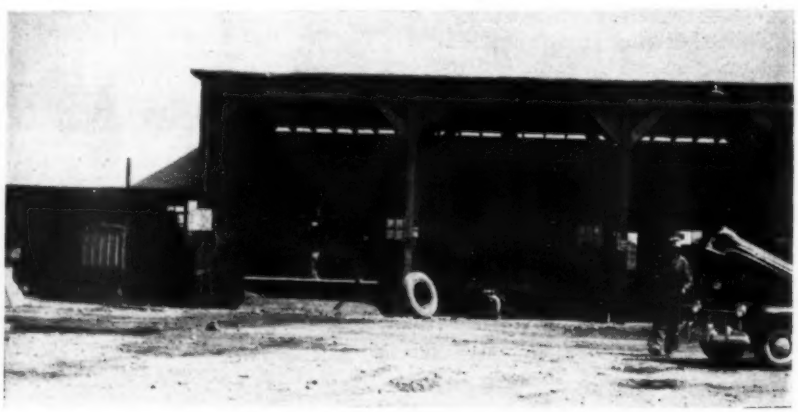
Build Labor Camp

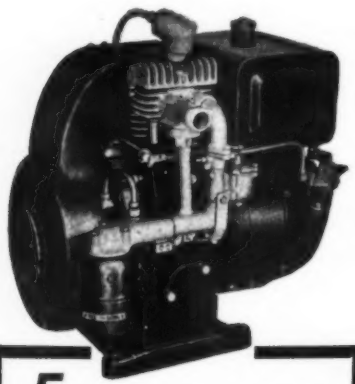
To meet the problem of labor scarcity at the beginning of Patterson Field operations, a camp housing 350 men was built by the contractor. Eight 50-men barracks were used for sleeping quarters. One barrack was used as a mess hall and a section of one was used for recreational purposes. Motion pictures were shown to the men at regular intervals in an improvised outdoor theater. Adequate shower facilities were provided for the men.

The camp was run on a strictly non-profit basis in compliance with an army request. The camp's books were checked periodically by army auditors.

Meals were served in the camp mess in the morning and evening and a lunch was packed for each of the men to bring to the job for the noon-day meal. Company trucks transported the men to and from the camp and the job. When

• A crew of from 10 to 15 mechanics handled all repairs on the job in this well-equipped repair shop located near the batching plant.





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• Inside of one of the eight 50-men barracks in the company's labor camp.

two shifts were working on the construction project, arrangements were made to serve meals for each shift at different hours. The mess was operated on a concession basis by the Patterson Field Post Exchange.

Due to the extremely critical manpower situation in the Dayton area, it was necessary for the various contractors to import their men from other sections of the country. Some of the men brought their families along and these men and their families lived in trailer camps near the project or obtained living quarters in the near-by towns of Fairfield, Osborne, Springfield and Dayton. There were 750 men employed on the project at the peak of operations and 600 employed on an average. About half lived in the labor camp.

Equipment repairs were made on the job. A crew of 10 to 15 mechanics handled all repairs in a well-equipped repair shop located near the batching plant. There were no serious delays at any time due to equipment breakdowns.

Safety measures on the job were taken on the recommendation of a safety engineer provided by the Army Engineers' Corps. An excellent accident frequency record resulted.

A daily diary of the job, recording all special operations and a running record of the progress of ordinary operations was kept by the contracting firm. The diary contained a record of where work was being done each day and roughly the amount of work accomplished.

The construction work done at Patterson Field by the M. J. Boyle Co. was under the jurisdiction of the Wright Field District Corps of Engineers under the command of Colonel Edwin C. Landberg. The project engineer was Captain J. J. Lamoureux. Field inspection and engineering was handled by a firm of architectural engineers, Consoer, Townsend and Quinlan of Chicago.

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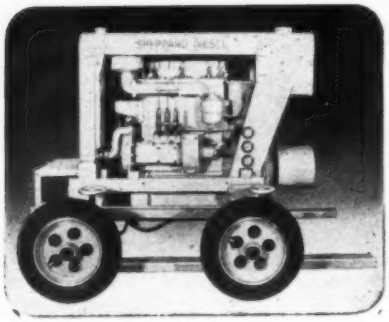

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Post-war Planning

(Continued from page 547)

renegotiate contracts, and we do not believe that it would prove satisfactory to attempt to let contracts now and renegotiate them after the war before the contractor starts work.

The number of men that will be employed during the peak of the program will depend entirely upon what funds are made available for construction purposes. During our past major highway program there was a peak of about 10,000 men working for the contractors and about 1,600 men working for the State Highway Department supervising construction, in addition to our regular maintenance forces.

We are using all available help that we have been able to secure in making surveys and developing plans for post-war construction, however, we are greatly handicapped due primarily to a shortage of draftsmen.

We do not have any information as to the plans of the various cities and counties. However, we understand a large number of them are making preparations for post-war projects.

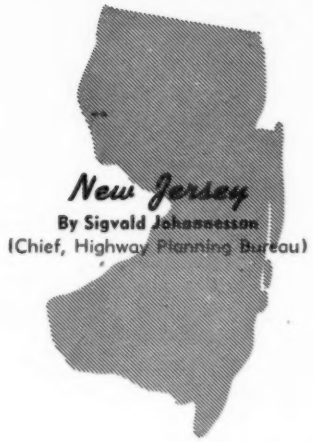
North Dakota

By Mark P. Wynkoop
(Chief Engineer)

Approximately $12,000,000 worth of contracts could be let within 30 to 60 days of peace day, provided we can pay our share of construction costs. Unless our revenue is increased we can take but little advantage of any large post-war construction program.

We have a shortage of engineering personnel, particularly so in the minor engineering positions.

Some contracts will be let on city work. Most counties however, do most of their road work with county owned equipment.



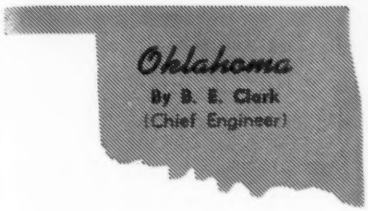
New Jersey

By Sigvald Johannesson
(Chief, Highway Planning Bureau)

The State Highway Commissioner, Spencer Miller, Jr., is fully aware of the importance of preparing for a sufficiently large volume of work to be ready for execution as soon as the war efforts are concluded, and is bending all his efforts to that purpose. Consequently it is expected that by April 1, 1944, there will be projects ready for immediate letting, covering approximately $35,000,000 worth of work and that for the next few years there will be additional projects ready for execution, amounting to about $70,000,000 each year.

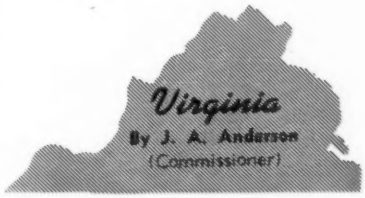
Although the larger part of these projects will be on State Highways, a considerable amount may be county and municipal work. For example, a survey has shown that more than 700 bridges in rural areas and with a span of more than 20 feet have a safe carrying capacity of less than 10 tons. It is contemplated, therefore, to include the reconstruction of many of these bridges in the post-war program.

The principal difficulty to overcome in order to accomplish this program is that caused by a scarcity of engineers, surveyors and draftsmen. However, the State Highway Department has already a large number of projects in various stages of preparation. By concentrating on those that can most readily be completed and by limiting the work to that which is essential, it is expected that the desired goal will be attained.



If the $3,000,000,000 Federal Post-War Bill passes, our total program in Oklahoma will amount to $100,000,000. At present, we have $5,000,000 State Highway contracts ready to let and at the end of this year, we will have $10,000,000 worth of contracts ready to let. By the middle of 1944, we are expecting to have a total of $35,000,000 worth of contracts ready for award.

We do not seem to have a bottleneck in this State on our Post-War Program, as we have six field parties organized, and at the present time we are building up our drafting forces, and by the time peace is declared, we will be prepared to let our contracts promptly.

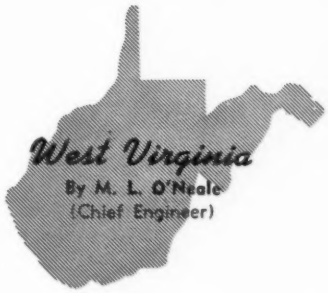


Plans for road and bridge construction amounting to approximately $12,000,000 have been completed. Plans in the amount of an additional $8,000,000 should be ready by the end of this year, making a total of approximately $20,000,000 by January 1, 1944.

We do not feel we are in a position to estimate how long it would take to arrive at maximum employment on new construction or the peak number of men who would be employed. Both of those questions would largely depend upon the conditions imposed on the work in order to absorb the unemployed. Obviously, if any statutory rule or regulation necessitated hand labor instead of machine labor, the maximum employment would be a great deal greater than if normal construction methods could be employed.

The bottleneck in getting out any post-war program is manpower. This applies to both field surveys and drafting.

The State Planning Board has established a post-war committee on public works which is, and will, actively encourage the preparation of plans by localities for needed and justified improvements.



The Defense Highway Act of 1941 allocated to West Virginia $109,600 of federal funds to be matched by the state for advance engineering, surveys and plans. This makes available $219,200 for such program. After considerable delay in getting Public Roads Administration approval of our program we finally got started on surveys in late January, 1943. Because of lack of engineers less than 25 per cent of this engineering work has been completed to date. The plans provided for by this $219,200 should give us about $7,000,000 of construction.

H. R. 2798 approved July 13, 1943 permits us to use balances in our Federal-aid, Federal-aid Secondary and Grade Crossing funds to the extent of approximately $563,000 for economic studies, surveys and plans for post-war highway construction. These federal funds likewise are to be matched by the state. We will thus have available, if we desire to so use it, approximately $1,126,000 for preparation of plans for post-war highway construction. This would require approximately 442 man years of engineering work. As we have been only able to put 45 to 50 men on our advance engineering program, and we have found it practically impossible to find additional men, you can readily see

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Haiss has the right bucket for your particular job, engineered all the way to give you bigger pay-loads through improved design and construction. A Haiss Bucket gives your crane a chance to break its own best performance records. Every Haiss Clamshell is built to do its particular type of work better. Fifty years of skill and experience in manufacture back it up.

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144th ST. & P.R.R. AVE., NEW YORK 51

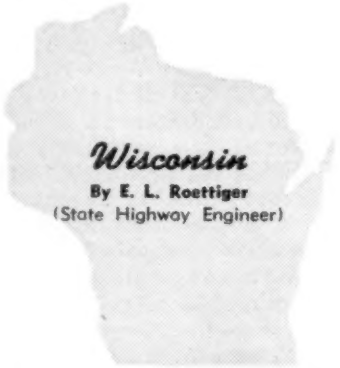
that the completion of this post-war program is far in the future unless conditions should change so that we can again obtain engineering personnel.

The brighter side of the picture lies in the fact that we had quite a large volume of plans in process at the time that war froze construction work. Surveys and plans at various stages of completion will provide construction of a value of approximately $19,000,000. Of this amount plans are complete on approximately $7,700,000 of work, between 75% and 100% complete on an additional $5,000,000 of work, and all together there are between 50% and 100% complete plans for approximately $15,300,000.

As indicated above our most serious problem is that of engineering manpower. As to finances we believe we will have sufficient funds which, together with contemplated federal funds, will permit us to proceed promptly with construction work to the extent of available plans at the close of the war. Of course the situation at that time is dependent upon the length of the war.

As to right-of-way, under the West Virginia law we have not had, and do not expect to have, any serious delay in acquiring what is necessary to start construction.

In West Virginia the State Road Commission has the responsibility for all highways, both primary and secondary, and there are no longer county or township roads. We also have the responsibility for all municipal streets which are a part of our primary system. As to the plans of the various cities for street improvements on those streets which are not a part of the state highway system, I have no information.



Wisconsin

By E. L. Roettiger
(State Highway Engineer)

The Commission is proceeding with the preparation of plans for highway improvements considered necessary and desirable as rapidly and to the extent available personnel permits. Surveys and plans have been authorized and are under way on approximately 920 miles of state trunk highway. Another 250 miles is in the process of consideration for authorization of detailed surveys and plans. The preliminary estimate of the cost of the work under such a program is approximately $70,000,000. Necessarily such estimate may be subject to substantial revision, based on the details developed by surveys and plans.

The current status of survey and plan work is about as follows: surveys are substantially completed on approximately 426 miles; on an additional 100 miles surveys are between the stage of being well under way and being substantially completed and on the remainder of the program surveys are between the stage of not having been started and being well under way. Plans on 202 miles of the program are substantially completed and on another 200 miles they are between the status of being well under way and substantially completed. For the remainder of the program plans have not been started.

Under the seasonable conditions prevailing in this state, all available man power is presently being used on survey work. At such time as conditions are not suitable for efficient survey work, our personnels' efforts will be directed toward planning. Time and available personnel will dictate the volume of work ready when the post-war period begins. Financing and other economic conditions will dictate the rate at which such work as is planned can be placed on the market in the post-war period.

(To Be Continued)

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Bulky, cumbersome machinery, and of late heavy pieces of defense equipment must be moved from place to place.
In some localities, where low headroom is encountered, this type of Rogers Trailer is used extensively.
Large machines, with crawler treads "straddle" the girders thus lowering the overall height by several inches, a definite advantage also in handling many kinds of equipment.
ROGERS
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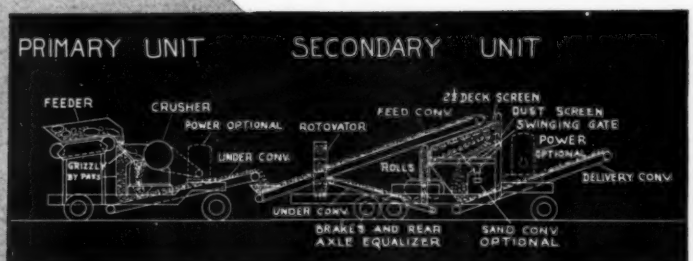
HEAVY DUTY
TRAILERS

"22,800 Yards Monthly Average With Our Universal 822-Q"



The 822-Q plant is available in three sizes: 16"x24", 20"x36" or 24"x36" crusher on primary unit; and 24"x16", 30"x18" or 40"x22" rolls on secondary unit.

Distribution of weight on two separate trucks provides greater portability, more flexible and faster set-up in quarry and protection to roads.

The Universal 822-Q "Two Unit" Portable Quarry Plant does an even more spectacular job than we claimed for it, according to users' reports.

The plant pictured has a 15"x36" jaw crusher on the primary unit and 30"x18" crushing rolls on the secondary unit. It has been averaging 22,800 yards monthly of ¾" and smaller crushed rock for war construction. "Only repair so far was a toggle replacement. Our diesel fuel costs us a fraction of a cent a yard of crushed material." Another operator reports 25,200 yards of ¾" material over a 30-day period.

The 822-Q may be the answer to your present high priority crushing job—and your "no priority" post-war jobs. Ask for Bulletin 30.

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(Formerly Universal Crusher Co.)
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UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

AWARDED ARMY E NAVY FOR EXCELLENCE AND PROFICIENCY

NOT in the Contract

A tractor salesman appeared at the recruiting office of the Army to enlist. "I suppose you want a commission," said the officer.

"No, thanks," was the reply, I'm such a poor shot I'd rather work on straight salary."

"You look as though you'd had a tough day, Jones."

"I have. My oiler tried that old gag about wanting the day to attend his grandmother's funeral. I thought I'd teach him a lesson, so I said I'd go with him."

"No a bad idea. How was the game?"

"It **was** his grandmother's funeral."

She: "It says here, 'Germans driven back into Italy'."

He: "Well, that's good news."

She: "It's a downright shame. Why don't they make them walk?"

"Are you sure your husband really goes hunting on those hunting trips he's always taking?" her catty friend asked.

"Oh, yes, absolutely," she replied.

"But he so rarely brings any game home."

"My dear, that's what makes me certain that he really goes."

The theme song of the Parachute Corps: "It don't mean a thing, if you don't pull that string."

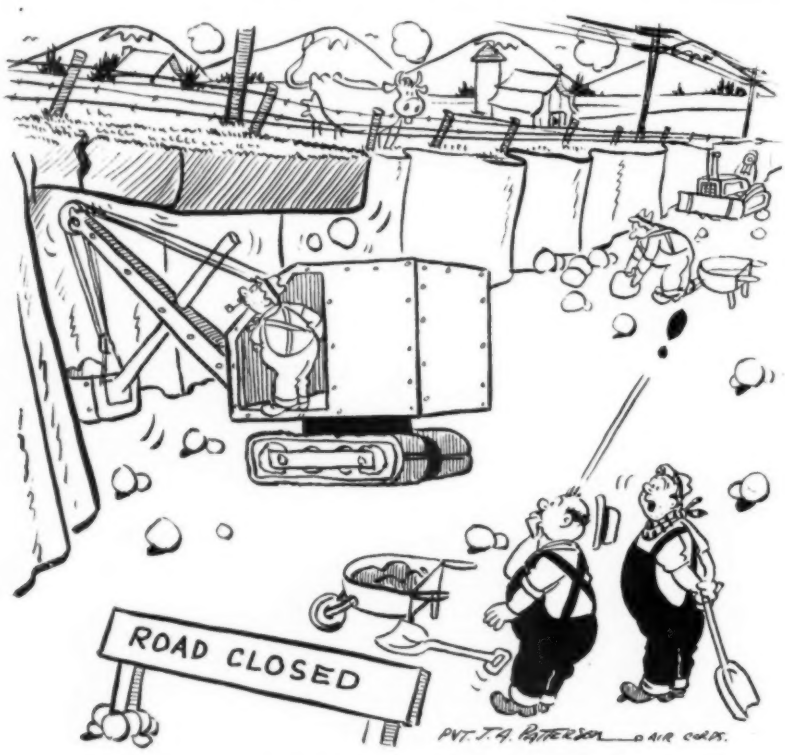
Just received a card from a friend who is a war worker. He writes: "Having a wonderful time and a half."

"And where is Cadet Smith?"

"A. W. O. L."

"What do you mean by that?"

"After women or liquor."



"I guess he'll just have to learn from experience."

A grave digger, absorbed in his thoughts, dug the grave so deep he couldn't get out.

Came nightfall and the evening chill, his predicament became more and more uncomfortable. He shouted for help and at last attracted the attention of a drunk.

"Get me out of here," he shouted, "I'm cold."

The drunk looked into the grave, and finally distinguished the form of the uncomfortable grave digger.

"No wonder you're cold," he said. "You haven't any dirt on you."

Fat Pedestrian (knocked down by a car): "Couldn't you have gone around me?"

Motorist: "I wasn't sure whether I had enough gasoline left to make it."

Wife: "How do you like my new gown? I got it for a ridiculous price."

Hubby: "You mean you got it for an absurd figure."

"The jungle was all around us. Ammunition, food, and whiskey had run out, and we were parched with thirst!"

"But wasn't there any water?"

"Sure. But it was no time to think of cleanliness."

A woman arrived late for the wedding. As she came rushing up to the door, an usher approached her for her invitation.

"I have none", she snapped.

"Are you a friend of the groom?" asked the usher.

"Certainly not!" the woman replied vehemently. "I'm the bride's mother".

A pink elephant might be called a beast of bourbon.

Kelley and Cohen were having dinner together. Cohen helped himself to the larger fish and Kelley said:

"Fine manners ye have, Cohen. If I had reached out first I'd have taken the smaller fish."

Cohen: "Vell, you've got it haven't you?"

She: "Whenever I'm in the dumps, I get myself another hat."

He: "I wondered where you got them."

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

MISCELLANEOUS EQUIPT.

Welding and Cutting Outfits, Torches, Regulators and Gauges, for heavy, medium and light welding and cutting.
Superior Oxy-Acetylene Co., Hamilton, Ohio

P&H Model 10-30 Trenching Machine Serial No. 3644. Depth 7'—10'—13', Width 22" 26"—30"—35". Power plant—Waukesha 55 HP. Very good condition and ready for immediate shipment. Priced for quick sale.
JAEGER Model 7S Concrete Mixer Hoist and pneumatic tires.
FOOTE Paver No. 3552—Model E-26.
Ingersoll's Equipment and Supply
19930 Detroit Rd.
Rocky River 16, Ohio

Dragline attachments for late model Bucyrus-Erie 37-B, including 60' boom and new Bucyrus-Erie 1½ yd. AX dragline bucket.
Box 2986

FOR SALE
Two 20-ton capacity 1937 Linn Tractor Trucks, Model L-37-D, powered with HB-6 150 H.P. Cummins-Diesel Engines with Spicer 4-speed forward and 4-speed reverse transmission. Commercial twin 4-section telescoping hoist. One tractor can be equipped with single action hydraulic bulldozer attachment suitable for road building. Price each—$7,500 f.o.b. Gilberton, Pennsylvania.
Gilberton Coal Co., Box No. 423, Gilberton, Pennsylvania.

Marion 32 Steam equipped with 60' boom, 60' leads and No. 1 Vulcan Steam Hammer. Good condition.
Ed. H. Honnen Construction Co., Colorado Springs, Colorado.

FOR SALE
SHOVEL FRONTS: 1 cu. yd. Osgood, ¾ cu. yd. Koehring 301, ½ cu. yd. Lorain 35. 1 cu. yd. P&H 600. BACKHOES: Byers Bear-Cat ¾ cu. yd., General ½ cu. yd. CRANE BOOMS: Universal 32' & 26', Brownhoist 31' & 20'. BUCKETS: ⅜ to 2 cu. yds.
P. O. Box 63, Valley Stream, N. Y. Phone: Hollis 5-4315.

FOR SALE
One Diesel Caterpillar No. 11 Road Patrol; One A-C tractor model K; One TA-40 Int. Tractor; One 27 E Rex Paver; Baker road-ripper model 2A-171; Asst. of Caterpillar housings and other caterpillar parts; 1 yd. Owen dragline bucket; 2½ yd. Page dragline bucket; One 6 cyl. Waukesha motor; also all kinds of usable A-C, Int. Caterpillar and Cletrac tracks. Sam. P. O. Box 182, East Point, Ga.

FOR SALE
18-ton Vulcan Locomotive, 42-inch gauge, in good working condition. Located at Pittsburg, Kansas. Box 2996

FOR SALE
Sand Lime Brick Equipment
3 Jackson Church Kilns 103' long with patent door one turn will close.
3 Jackson Church press.
1 Bar mill.
3 Feeders.
Concrete Mixers—Used
20 Mixers—3 and 4 yds. Rex—Ransome—Jaeger.
Watertown Builders Supply Company
418 Arsenal St.
Watertown, Mass.

FOR RENT
1 yd. Bucyrus-Erie 32-B
1¼ yd. Lorain 69
Diesel shovels, cranes, clamshells, and draglines.
393 Brookline Street,
Newton Center, Mass. Tel. LASell 4300

6—15 yd. cat wagons, bottom dump, 2 compartment. Located near Chicago.
Box 2994

FOR RENT OR SALE
No. 101 Lima Crane, Shovel & Drgline.
Osgood Shovel & Crane.
Marion 1 yd. Shovel & Crane.
6 bag 27E Koehring Paver.
Waller Paving Company, Inc., P. O. Box 46, Salisbury, Maryland. Telephone No. 1166

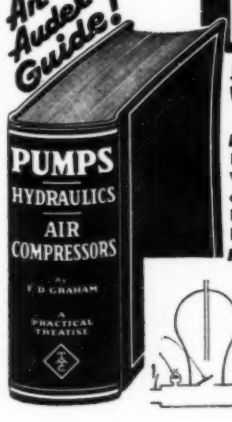
2 Rex No. 200 Double Pumperete with Waukesha six cylinder Gas Engines. Complete with Pugmill remixers, and 1200 ft. 8" pipe.
12 Wagon Drill Type FM2, Serial X71 W.D. drifters. Pneumatic tires.
4 310 cu. ft. Portable I-R Compressors. Steel Wheels, Gasoline driven.
GREAT LAKES DREDGE AND DOCK COMPANY
122 South Michigan Avenue
Chicago 3, Illinois

50-B SHOVEL FRONT
Shovel front end for 50-B steam machine. 26 ft. boom, 17 ft. dipper stick, and 2 yd. dipper. Will sell for $1000 cash f.o.b. mine. Pittsburg, Kansas district. Box 2995

FOR RENT OR FOR SALE
Bucyrus 10B drag-clam truck crane; Koehring 301 crane shovel; Northwest 105 drag; No. 95 Northwest—70' boom, 3-yd.; No. 6 Northwest 1½-yd. shovel; Lima 601—60' boom; 1¾-yd. drag bucket; 1½-yd. fairlead; AC light plant.
A. W. Nevers, Mt. Pleasant, Iowa

Erie steam shovel type B, serial No. 1579, equipped with 21' boom, 22' dipper handle, ¾ yd. dipper. It has a 44½"x88" vertical boiler in good condition. Price reasonable. Located Ohio. Box 2987

An Audel Guide!



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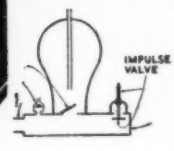

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LARGE SHOVELS, CRANES AND DRAGLINES
1½ YDS. AND UP

FOR SALE
Used model 4160 electric shovel, centrally located. Box 2997

BUCYRUS-MONIGHAN 2T Walker—Bucyrus-Erie 37B Gas—Bucyrus-Erie 30B Steam. Location northwest. Box 2969

Electrically Operated
175-B Ward-Leonard electric shovel with 65' boom, 42' handle. Can handle 4 or 5 yard dipper for stripping or 7 yard dipper if used for coal loading. Operated one-third of time loading coal since shipment. Excellent condition. Can be demonstrated. Reasonably priced. Ready for immediate delivery. Box 2993

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WANTED
Shovels and Draglines
Ingersoll's Equipment & Supply
19930 Detroit Rd.
Rocky River 16, Ohio

WANTED
60" x 8' 6" vertical boiler.
P. O. Box 63, Valley Stream, N. Y. Phone: Hollis 5-4315.

WANTED TO BUY
Traxcavator front end loader, preferably with diesel cat., ¾ yd. capacity or more. Will pay good cash price for same. Wire or write location for inspection.
Miller Excavating Co., 4961 Center St., Omaha, Neb.

WANTED
One or two side dump cars, 2 ton cap.
One turn table for above car.
Gas hoist single or double drum to pull three ton load up 45 degree incline.
Gas crane—¼ yd., full revolv., mounted on to mount on short W.B. truck.
Central Coal Co., Madison, Ind.

WANTED
Shovel attachment for Model 19-B Bucyrus-Erie.
GAINES BROS., 328 Security Bank Bldg., Miami, Oklahoma.

WANTED
Shovel attachment, complete, for Bucyrus-Erie 20-B machine. Give full particulars in first letter, please. Located in Kentucky. Box 2998

New trade literature

Title: **"Welder's Vest Pocket Guide"**
Subject: A twenty-page booklet filled with helpful notes and illustrations dealing with welding procedure, attractively illustrated with charts, diagrams and photographs.
Where to Get: Hobart Brothers Co., Troy, Ohio.

Title: **"Fairbanks-Morse Diesels For Profitable Power"**
Subject: An attractive four-page bulletin printed in two colors and includes the brief history of the company's background, together with particulars on design, manufacture and service facilities applicable to the entire commercial line of marine and stationary Fairbanks-Morse Diesels.
Where to Get: Fairbanks-Morse & Co., Chicago 5, Illinois.

Title: **"Young Heat Transfer Equipment for Every Application"**
Subject: An eight-page catalog illustrating temperature regulator of radiators, heat exchangers, cooling units, cooling and condensing sets.
Where to Get: Young Radiator Company, Racine, Wisconsin.

Title: **"Westco Industrial Pumps Catalog No. 43"**
Subject: A very well illustrated catalog complete with specifications on many different types and sizes of pumps. The illustrations are large and very clear and the specifications are charted in an easily read form.
Where to Get: Joshua Hendy Iron Works, Pomona Pump Co. Division, St. Louis, Missouri.

Title: **"Planning With You"**
Subject: An interesting treatise of the way post-war planning of communities should be done. Some of the subjects dealt with are: replanning to serve changed needs—why cities decay—what is wrong with planning—what the modern city needs. Serious thought has been given to the text of the small booklet.
Where to Get: The Architectural Forum, division of Time, Inc., 19 West 44 Street, New York City 18.

Title: **"How to Keep Your Wire Rope Working"**
Subject: A pocket-size handbook with 80 pages of vital information on the care of wire rope. Diagrams and photographs are used profusely to illustrate the text. Some of the subjects covered are: abrasion, safety factors, inspection, putting rope to work, etc.
Where to Get: American Chain & Cable Company, Inc., Bridgeport, Connecticut.

POSITIONS WANTED

Address all box numbers c/o EXCAVATING ENGINEER South Milwaukee, Wis.

SHOVEL OPERATOR
Experienced operator seeks work in Southern California to be near relatives working in war industries. 13 years experience on shovels of all types of power. Prefers Northwest. Can make own repairs. Also has operated tractors, etc. Age 41 years; married; one child, school age. Selective service 3-A. Box 9215

STRIPPING SHOVEL OPERATOR
Experienced operator with 40 years service on steam, gas, and electric wants work on stripping shovel or dragline. Steady worker; able to make own repairs. Willing to go anywhere. Now located Pennsylvania. Box 9214

OPERATOR—15 YRS. EXPERIENCE
Operator of shovels, draglines and clamshells up to 3 yards capacity wishes steady employment on any type of machine—gas, diesel, or steam—anywhere in U.S.A. Age 38; married; Selective Service classification 3AH. Prefers general excavating, sand and gravel or stock pile work. Now located Wisconsin. Box 9213

HELP WANTED
Silica Sand Plant Supt. Permanent position. Give all qualifications, past experience, place and date of birth, salary expected. Box 9216

DRAGLINE-CRANE OPERATOR
Operator with 27 years experience anxious to locate steady job anywhere. Have operated gas, steam, diesel and electric draglines and cranes from one-half to eight yards capacity. Can make own repairs. Age 41. Selective Service Classification—3AH. Can furnish references. Now located in Mississippi. Box 9217

Notes from the manufacturers

Stuart M. Christhilf and Company, 200 E. Lombard Street, Baltimore 2, Maryland, announce the firm's office and warehouse has been moved to 134-136 West Mt. Royal Avenue, Baltimore 1, Maryland. The new quarters offer more operating space and warehouse, according to the announcement.

The Timken Roller Bearing Company, Canton 6, Ohio, announce the appointment of Whitley B. Moore as director of sales for all divisions of the firm. Mr. Moore has been with the company since the close of World War I after service in the Navy.

Westinghouse Electric and Manufacturing Company, Pittsburgh, Pennsylvania, announce the election of Gwilym A. Price as a vice-president of the company.

The company also announces the appointment of Thomas I. Phillips, vice-president of the company as head of the firm's Pittsburgh divisions.

International Harvester Company, 180 N. Michigan Avenue, Chicago, Illinois, announce the establishment of a "Consumer Relations" department with over-all supervision of many activities. A. C. Seyfarth, formerly advertising manager, and C. E. Johnson, assistant, assume direction of the new department. Divisions apart from advertising are Farm Practice Research, Market Analysis, Sales Promotion, Advertising Material, Parts Catalogs and Instruction Manuals, Education and Training, War Products Service, and Canadian and Export.

Twin Disc Clutch Company, Racine, Wisconsin, was awarded the Army-Navy "E" for outstanding production of war materials. The award was presented September 25, 1943.